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# ROYAL AUSTRALIAN AIR FORCE



**DEFENCE INSTRUCTION (AIR FORCE)**

**AAP 7213.003-34**

**WEAPONS DELIVERY MANUAL**

**MIRAGE IIIO AND IIID**

THIS MANUAL COMPLEMENTS DI(AF) AAP 7213.003-1 AND  
SUPERSEDES AAP 7213.001-1-2 AND AAP 7213.002-1-2

**Date : 01JUN78**

**Sponsor : DAP-AF**

A handwritten signature in black ink, appearing to read 'J.A. Rowland', is positioned above the printed name and title.

(J.A. ROWLAND)  
Air Marshal  
Chief of the Air Staff

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Amendment List		Topic Affected	*Amendment Effect	Amended By	Date
No	Dated				
			AL's 1 to 25 Previously Incorporated		
26	JUL 87		Replacement Pages	R. HIRVONEN	8 SEP 87
27	JULY 87		Incorporate A.P.F. Suppl. No 34	<i>[Signature]</i>	8/9/87
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\*Note. Insert brief details of page(s) amended, inserted or cancelled.



# AMENDMENT CERTIFICATE

It is certified that the amendments promulgated in the undermentioned Amendment Lists have been incorporated in the Publication:—

Amendment List		Topic Affected	*Amendment Effect	Amended By	Date
No	Dated				
1	1 JUN 78	AIRCRAFT WEIGHTS	SUPP STATUS SHEET SUPP N <sup>o</sup> 1	<i>[Signature]</i>	29 MAY 79
2	SEP-79	SECT 6	SUPP STATUS SHEET SECT 6 New Pages	<i>[Signature]</i>	11-SEP-80
3	11 JUN 78	DRAG INDICES	STATUS SHEET SUPP N <sup>o</sup> 2	<i>[Signature]</i>	18 JUN 80
4	11 JUN 80	SECT 2	STATUS SHEET	<i>[Signature]</i>	9-SEP-80
5	11 JUN 80	SECT 122	STATUS SHEETS	<i>[Signature]</i>	2-OCT-80
6	1-JUN-80	SECT 6	STATUS SHEET SUP 6	<i>[Signature]</i>	27-JUN-80
7	14 FEB 81	SECT 2	SUPP N <sup>o</sup> 7	<i>[Signature]</i>	2 MAR 81
8	1-JUN-81	SECT 6	SECT 6 Supp 3, 4, 5, 6	<i>[Signature]</i>	16-AUG-81
9	18 AUG 81	WHOLE	NEW PAGES	<i>[Signature]</i>	14 APR 82
10	30 APR 82	WHOLE	NEW PAGES.	<i>[Signature]</i>	30 AUG 82
11	19 JUL 82	SECTS, 1, 2, 3	SUPPS. 10, 11, 12.	<i>[Signature]</i>	11 AUG 82.
12	16 AUG 82	SECT 2, 3	REMOVE RAAF SUPS 11, 12. INSERT RAAF SUPS 13 & 14	<i>[Signature]</i>	30 AUG 82.
13	23 AUG 82	SUP.	REMOVE SUP. 1.	<i>[Signature]</i>	26 MAR 84
14	9 NOV 82	SUP.	INSERT NEW PAGES	<i>[Signature]</i>	26 MAR 84
15	7 OCT 83	SUPS	NEW RESTRICTED BINDER. NEW SUPS. 15-22.	<i>[Signature]</i>	26 MAR 84
16	28 JUN 83	SECT 1.	NEW PAGES.	<i>[Signature]</i>	26 MAR 84
17	FEB 84	SUPS	REMOVE SUPS 15-19 INSERT NEW SUPS -23-27.	<i>[Signature]</i>	4 MAY 84
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21	MAR 85	SUP	SUP NO 31 (replacing SUP 28 no 2)	<i>[Signature]</i>	22 MAR 85
22	22 MAY 85	SUP & SECT 22	SUPPLEMENT STATUS Page 2-17/18	<i>[Signature]</i>	25 JUN 85
23	16 JUN 85	SUP 32	SUP 32 into 2-4	<i>[Signature]</i>	23 AUG 85
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25	JUN 86		REMOVE SUPS 20, 23, 24, 25, 26, 27	<i>[Signature]</i>	03 DEC 86

\*Note. Insert brief details of page(s) amended, inserted or cancelled.



## **FLIGHT MANUAL AND SUPPLEMENT STATUS SHEET**

### **Instructions**

This sheet accompanies each issue of Supplements to the Flight Manual.

Insert each attached Supplement in accordance with its instructions. The information in each Supplement supersedes that in the published text to which reference is made.

This sheet is to be inserted immediately after the list of effective pages, replacing the sheet accompanying the previous Supplement issue.

Commanders are responsible for bringing the content of the attached Supplements to the attention of affected personnel.

### **General**

Supplements to Flight Manuals are issued as a means of incorporating information of a temporary nature, as an interim method of directing attention to changes to the aircraft operating procedures or limitations pending issue of a formal amendment and as a means of incorporating information where it is not practicable to amend the published text. Periodically, information contained in Supplements will be consolidated and issued as an amendment to the publication.

The reverse of this sheet lists all current Supplements applicable to this manual. Also listed is the Amendment List status of each associated publication, current at the date of issue of this sheet.

Flight Manual and Supplement Status Sheet

This page lists the current status of the Weapons Delivery Manual, associated Checklist and Supplements applicable to Mirage IIIIO and IIID weapons employment. Supplements are issued in numerical sequence - if you are missing one listed, a copy may be obtained from your unit TPO/Library.

<u>Current Flight Manuals</u>	<u>Date</u>	<u>Last AL</u>	<u>Last RS</u>
AAP 7213.003-34	1JUN78	27	34

<u>Current Aircrew Checklists</u>	<u>Date</u>	<u>Last AL</u>
AAP 7213.003-34CL	1JUN78	14

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34	JUL87	Matra R550 Drag Indices	Page 6-25

RAAF Supplements Cancelled by this AL

Nil.



# LIST OF EFFECTIVE PAGES

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The portion of the text affected by the AL is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands.

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COMPLIANCE CERTIFICATE

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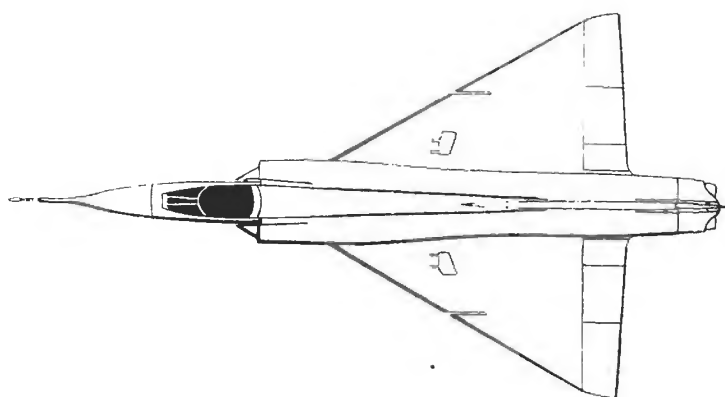
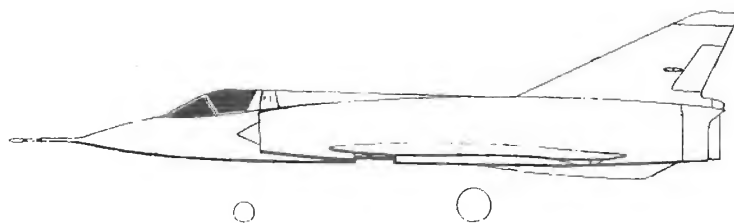
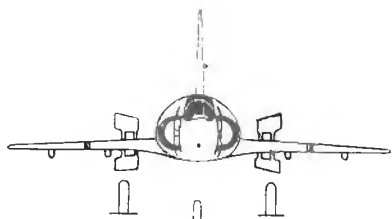
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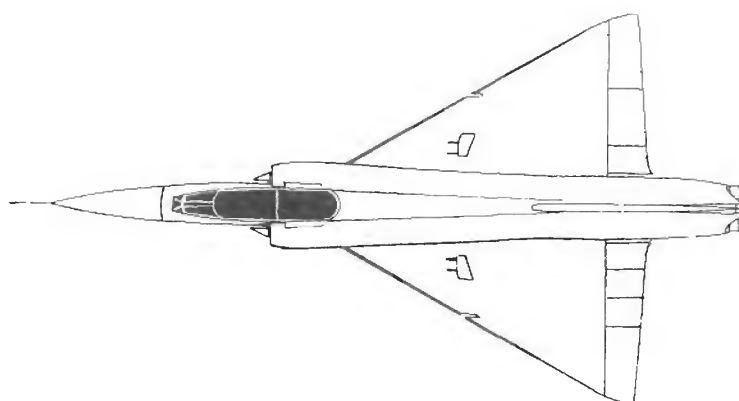
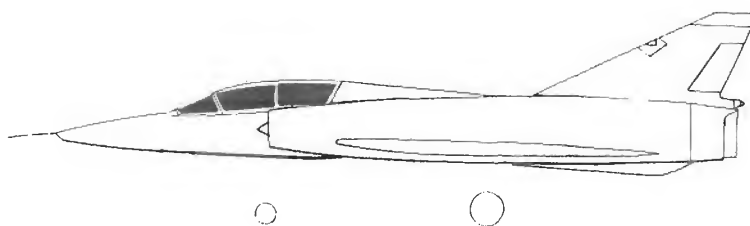
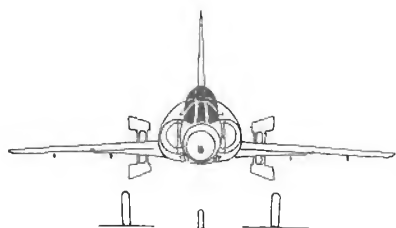
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Pages changed or added by the current AL are indicated by asterisks.

## Mirage IIIO Aircraft



## Mirage IIID Aircraft



## FOREWORD

### AUTHORITY

This Weapons Delivery Manual is an authoritative publication. It is compiled from data obtained from operating, technical, manufacturing, and safety sources and represents the best level of information available.

### SCOPE

This manual contains the data necessary to plan and execute air-to-air and air-to-ground weapons delivery missions in the Mirage IIIO and IIID aircraft. Detailed information concerning WNS components which form part of the basic aircraft is given in DI(AF) AAP 7213.003-1. Coverage of the WNS is repeated in this manual only to the extent necessary for continuity and understanding. The manual :

- describes weapon employment, the aircraft's weapons and their suspension systems and fuses, training weapons and ECM stores,
- details normal and emergency procedures associated with the carriage and delivery of weapons, and
- provides data necessary to determine sighting and release conditions for the weapons described.

### OPERATING INSTRUCTIONS

The manual provides the best possible operating instructions; however, on occasions these instructions may prove to be a poor substitute for sound judgement. Multiple emergencies, adverse weather, terrain and other considerations may require modification of the procedures.

### PERMISSIBLE OPERATIONS

The Weapons Delivery Manual takes a positive approach and normally states only what the pilot may do. Unusual operations or configurations are prohibited unless specifically covered herein. Clearance must be obtained before any questionable operation not specifically permitted in this manual is attempted.

### USE OF THE MANUAL

To use the Weapons Delivery Manual correctly it is necessary to understand the division of the Manual into its sections and the subsequent division of the sections. Each section has a table of contents, and best use will be obtained from the Manual by becoming familiar with the table of contents for each section. The alphabetical index enables easy reference to a particular topic or item by page number.

### PRESENTATION OF MODEL DIFFERENCES

Much of the information is common to both Mirage IIIO and IIID models. Throughout the manual the following principles have been observed to illustrate the different information for each model :

- The information is common to both aircraft models unless otherwise indicated.
- Where the information for the two aircraft models differs, the IIIO information is always presented first. The IIID information will be prefixed by the symbol **D** and will immediately follow the IIIO information.
- Where figures are substantially different they appear under a self-explanatory title, eg IIID Weapon System Controls.
- Checklist procedures are arranged in the order that they are performed in the IIIO aircraft. Specific normal or emergency checklist procedures for the IIID aircraft are at the end of the appropriate block of IIIO text prefixed by the symbol **D** or an appropriate heading.
- Unless indicated, equipment in the IIIO cockpit is also fitted in the IIID front cockpit and is not significantly different in appearance, operation or location.

### MAJOR DIFFERENCES BETWEEN MODELS

The Mirage IIIO is a single seat, all-weather interceptor and tactical strike aircraft. The Mirage IIID is a two-seat trainer version of the Mirage IIIE/IIIO. The IIID's operational capability is limited by lack of the following systems/components, fitted to the IIIO :

- Cyrano IIB radar.
- Matra R530 missile.
- Changeable nose cones.
- Doppler radar navigation equipment.
- Roll stabilisation.

### CHECKLIST

The Weapons Delivery Manual contains amplified checklists. The abbreviated Weapons Delivery Checklist is issued as a separate document (DI(AF) AAP 7213.003-34CL). Checklist items with alpha/numeric identification in the Weapons Delivery Manual are repeated identically in the Weapons Delivery Checklist.

### COCKPIT MARKINGS

The use of block capitals in the text when identifying

equipment, controls, switches, and positions, indicates the markings which actually appear in the cockpit.

#### **AIRSPEDS**

All airspeeds quoted in this manual are indicated airspeeds unless otherwise stated.

#### **WARNINGS, CAUTIONS, AND NOTES**

The following definitions apply to 'Warning', 'Cautions', and 'Notes' found throughout the manual.

##### **WARNING**

Operating procedures, techniques etc., which will result in personal injury or loss of life if not carefully followed.

##### **CAUTION**

Operating procedures, techniques, etc., which will result in damage to equipment if not carefully followed.

##### **Note**

Operating procedures, techniques, etc., which it is considered essential to emphasize.

#### **AMENDMENT ACTION**

To assist in maintaining this publication at a high standard, users are to bring to the notice of higher authority, without delay, any errors, omissions or suggestions for improvement. This should be done through the Unit Flight Manuals Officer. Attention is drawn to DI(AF) OPS 5-2.

Urgent flight safety information is disseminated to users by message as interim amendments (IAL). IAL may authorise pen amendment of the manual/checklist and are superseded by a formal amendment list.

RAAF Supplements (RS) are issued as required and may authorise pen amendment of abbreviated checklists. RS are periodically superseded by white page replacements.

The current amendment list (AL) status of each white page in the manual is defined in the List of Effective Pages (LOEP). The currency of applicable RAAF Supplements is defined in the Flight Manual and Supplement Status Sheet (FMSSS). Ensure the integrity of your manual by periodically checking its content against the LOEP and FMSSS.

## GLOSSARY

AA	Angle of Incidence	gal	Gallon
ACFT	Aircraft	gal (Imp)	Gallon (Imperial)
AC	Alternating Current	gal/min	Gallon Per Minute
A.C.	Autocommand	GB	Gunbay
ADC	Air Data Computer	GBT	Gun Bay Tank
AEC	Automatic Exposure Control	GCI	Ground Controlled Intercept/Interception
AFC	Automatic Frequency Control	GP	Gun Pack
AG	Angle of Gunfire	G/R/M	Guns, Rockets, Missiles
AGL	Above Ground Level	G/S	Gunsight
A/H	Artificial Horizon	HE	High Explosive
AMSL	Above Mean Sea Level	HES	High Explosive Substitute
AOA	Aim-off Angle	hm	Hectometres
AOD	Aim-off Distance	HOJ	Home on Jam
AOP	Aim-off Point	HVAR	High Velocity Aircraft Rocket
ASAP	As Soon As Possible	Hz	Hertz (cycles per second)
ASI	Air Speed Indicator	IAS	Indicated Air Speed
AUW	All Up Weight	ICAO	International Civil Aviation Organisation
BOMB	Bezu Output Multiplier Box	IMC	Image Motion Compensation
BR	Bomb Range	IMC	Instrument Meteorological Conditions
C	Celsius	IMN	Indicated Mach Number
CAS	Calibrated Air Speed	INM	Indicated Nautical Miles
CB	Circuit Breaker	Io	Optimum Impact Point
CBU	Cluster Bomb Unit	I/P	Identification of Position
CG	Centre of Gravity	IR	Infra-Red
cm	Centimetre	Ir	Release interval Between Bombs
CPS	Cycles Per Second	ISA	International Standard Atmosphere
DA	Drift Angle	K	Navigation Constant
daN	Decanewton	KCAS	Knots Calibrated Air Speed
DC	Direct Current	KEAS	Knots Equivalent Air Speed
DH	Decision Height	kHz	Kilohertz
Dopt	Optimum Firing Distance	KIAS	Knots Indicated Air Speed
DR	Dead Reckoning	km	Kilometres
ECM	Electronic Counter Measures	kn	Knots
EPM	Estimated Point Marker	KTAS	Knots True Air Speed
ETA	Estimated Time of Arrival	kV.A	Kilo Volt Ampere
EU	Electronic Unit	kW	Kilowatt
FMC	Forward Motion Compensation	L	Left
form	Formation	LCPB	Low Charge Practice Bomb
FP	Flight Path	LGB	Laser Guided Bomb
FRL	Fuselage Reference Line	LOS	Line of Sight
FUS	Fuselage	M	Indicated Mach Number (when quantified)
'g'	Load Factor		
g	Gram		

m	Metre	SS	Special Stores
MAC	Mean Aerodynamic Chord	SSU	Station Storage Unit
max	Maximum	S.W.	Sidewinder
MFBL	Mean Fixed Bore Line	TAS	True Air Speed
min	Minimum	TACAN	Tactical Air Navigation
min	Minute	TGP	Twin Gyro Platform
mm	Millimetres	Tmax	Missile's Maximum Time of Flight
MN	Mach Number (true)	Tmin	Missile's Minimum Time of Flight
MSEA	Minimum Safe Ejection Altitude	Topt	Optimum Firing Point
MSL	Mean Sea Level	TX/RX	Transmitter/Receiver
nav	Navigation	TX	Transmitter
N	Newton	UHF	Ultra High Frequency
NM	Nautical Mile	V	Volts
OLA	Ordnance Loading Apron	Va	Velocity of Aircraft
PHI	Position Homing Indicator	V.A.	Volt Amperes
Pk	Probability of Kill	VAC	Volts Alternating Current
PL	Pattern Length	Vc	Closing Speed
PPI	Plan Position Indicator	VDC	Volts Direct Current
PRNC	Photo Reconnaissance Nose Cone	Vg	Groundspeed
PRF	Pulse Repetition Frequency	Vm	Velocity of Missile
QFE	Airfield Barometric Pressure	Vm	Muzzle Velocity
QNH	Airfield Barometric Pressure Adjusted to Sea Level	VMC	Visual Meteorological Conditions
R	Right	Vr	Release TAS (ft/sec)
rad	Radian	VSI	Vertical Speed Indicator
RF	Radio Frequency	W	Watts
RPM	Revolutions per Minute	WLE	Wet Leading Edge
RTB	Return to Base	WNS	Weapons Navigation System
RX	Receiver	WSCP	Weapon System Control Panel
S/B	Speed Brakes	W/V	Wind Velocity
sec	Second (Time)		



**SECTION 1**  
**DESCRIPTION AND OPERATION**

## SECTION 1

## DESCRIPTION AND OPERATION

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RAAF SUPPLEMENT NO 33

MATRA R530/MATRA R550 TERMINOLOGY

Instructions

This supplement is to be inserted facing page 1-1.

Action

Throughout this manual, read the following:

Wherever the unqualified term 'MATRA' is used in this publication, it is assumed that it refers to the MATRA R530K missile.

4JUN86

SECTION 1

DESCRIPTION AND OPERATION

WEAPONS FIRE CONTROL AND  
NAVIGATION SYSTEMS

In the air-to-air role, the weapons navigation system (WNS) provides the capability to employ the Matra R530K medium to high altitude missile, the Sidewinder 1A (AIM9B) and the Defa 30 mm guns.

In the air-to-ground role, the system provides a limited high or low level all-weather navigation capability. Conventional air-to-ground weapons can be carried and, although a limited radar bombing capability exists, weapons are generally visually released.

□ Lack of the Cyrano IIB radar, its associated fire control systems and ground mapping radar restricts the Mirage IIID to VMC operations. Sidewinder missiles and the Defa 30 mm guns can be employed in the air-to-air role but must be fired using visual range estimation. In the air-to-ground role, the Mirage IIID must be navigated using DR or visual navigation techniques. Conventional air-to-ground weapons can be carried.

The components of the WNS (refer to Fig FO 1-1 and FO 1-2) are discussed in the following paragraphs.

**CYRANO IIB RADAR**

The Cyrano IIB radar is described in DI(AF) AAP 7213.003-1, Section 1.

**Air-to-Air Function**

With the Cyrano IIB radar in the air-to-air function, the pilot may search for targets out to 27 NM in either 60° or 30° scanning modes. In these scanning modes a 6 NM scale may also be selected.

There are two automatic lock-on modes (spiral scan and air-to-air range) and two manual lock-on modes. A semi-automatic lock-on mode (anti-jam) may be used in a limited ECM environment. After lock-on, the pilot receives an optical sight presentation (sight orders) as a head up display in the gunsight which, when followed, places the aircraft in a position to release the selected weapon.

**Air-to-Ground Function**

In the air-to-ground mode, the Cyrano IIB radar enables the pilot to radar navigate out to 50 NM ahead of the aircraft, at high level or low level. A 15 NM scale may also be selected.

**GYRO REFERENCE SYSTEM**

The gyro reference system provides accurate information of aircraft attitude in pitch, roll and heading. This information is used to stabilize the radar scan patterns and provide information to the WNS as well as supplying the Bezu attitude reference. The gyro

reference system is described in DI(AF) AAP 7213.003-1, Section 1.

**GUNSIGHT**

The CSF type 97K optical gunsight is a radar computing gyro gunsight. In the air-to-air functions (MISS, S.W., GUNS), the gunsight displays sight orders to the pilot which, when followed, positions the aircraft in the firing envelope of the selected weapon. In the air-to-ground functions (NAV, G/R/M, HE BOMB), the gunsight provides a fixed reference which may be adjusted by means of the sight depression rheostat to release the conventional weapons. The gunsight is described in DI(AF) AAP 7213.003-1, Section 1.

**DOPPLER**

The doppler system provides the pilot with a direct readout of aircraft groundspeed and drift angle. When the system is locked on, this information is directed to the PHI navigation computer, thus enabling accurate computation of the aircraft's position in relation to the grid origin, or to the selected PHI station. The Doppler system is described in DI(AF) AAP 7213.003-1, Section 1.

**WEAPONS SYSTEM COMPUTERS**

The WNS (refer to Fig FO 1-1 and FO 1-2) includes a number of analog computers which receive, process and distribute information, thus enabling the various automatic components of the WNS to function. These computers are the :

- a. air data computer and ADC output multiplier,
- b. PHI computer,
- c. radar nav computer,
- d. fire zone computer, and
- e. Matra computer and harmonization box.

□ The radar nav, fire zone and Matra computers are not fitted.

**Air Data Computer**

The air data computer (ADC) receives total and static pressures from the pitot probe, impact temperature from the impact probe, and incidence from the incidence probe. This data is converted into electrical signals representing static and dynamic pressure, pressure altitude, Mach number and TAS. These signals are passed to the ADC output multiplier which amplifies and distributes them to various components requiring this information. The ADC, as well as passing TAS to the output multiplier, passes the signal directly to the PHI computer.

### PHI Computer

The PHI computer determines the aircraft's position as a bearing and distance from an origin or from a station whose co-ordinates are set in the station storage unit (SSU). Inputs from the ADC (TAS), the heading reference system (grid heading) and the wind speed resolver (preset wind velocity) or Doppler ground speed and drift are used to compute the aircraft's DR position, which is compared with resistances representing the origin or station co-ordinates set in the SSU. This comparison is made in a grid format which is then converted to polar co-ordinates and displayed on the PHI as magnetic bearing and distance.

### Radar Navigation Computer

The radar nav computer determines the optimum flight path to a target during the radar tracking phase. After lock-on, it receives inputs representing the target angular velocity, range and closing speed. These inputs are compared with the aircraft's attitude, which is supplied by the Bezu Output Multiplier Box (BOMB). After being modified by aircraft performance inputs from the ADC, pitch and roll orders are presented to the pilot visually through sight orders to bring the aircraft into the firing plane at a rate acceptable to the aircraft's performance. This rate is further modified by the 'g' limiting accelerometer, which allows pitch orders to increase 'g' loading at a maximum increment of 1 'g' between -1 and +4 'g' limits. After Matra firing, the radar nav computer issues breakaway orders when the fire zone computer predicts missile impact.

### Fire Zone Computer

The main role of the fire zone computer is to continuously compute the parameters of a simplified missile fire zone and indicate aircraft entry to the fire zone by illumination of the green fire zone light. With the weapons system selector rotated to MISS (Matra), it also determines a launch point (Topt) within the zone from which the missile has the greatest kill probability (Pk). The fire zone computer only computes for a positive closing speed even though the green light may be illuminated for a target moving away. In addition, it computes missile to aircraft range enabling the radar nav computer to determine the instant and direction of breakaway to avoid damage from the detonating missile or target break-up. The fire zone computer assumes at all times that the target is flying straight and level. Changes to the fire zone due to target manoeuvres are not calculated.

#### Note

The fire zone computer does not take into account target manoeuvres, aircraft angle-off to the target or negative closing speed.

### Matra Computer and Harmonization Unit

The Matra computer ensures that the missile flies the optimum track to the target. An output from the

ADC representing altitude is added to the target closing rate which is derived from the radar. This computation results in a navigation constant (K) being fed to the missile navigation circuits, thus optimising the flight path of the missile. The computer also alters the time delay to the warhead, depending on target closing rate. The warhead time delay is set to maximum for a line astern attack and to minimum for a head-on attack.

The harmonization unit aligns the Matra and radar frequencies and target tracking circuits after radar lock-on, ie the missile and radar RF and PRF, antennae and range gates. The unit also contains the mask computer, which alerts the pilot by audio signal that the Matra missile receiver cannot acquire the target. If the missile is fired without target acquisition, it will be unguided.

#### Note

The 'mask zone' is computed from the radar antenna axes independent of the Matra antenna.

## FIRE CONTROL NAVIGATION

In the air-to-air modes, fire control navigation is the manner in which the aircraft is guided by sight orders to an ideal position for missile or gun firing. The air-to-air fire control system is shown in Fig FO 1-1. Fire control navigation applies to the following air-to-air modes :

- a. Matra,
- b. Sidewinder,
- c. guns, and
- d. anti-jam.

### APPROACH NAVIGATION

The approach navigation used in Matra, Sidewinder and gun attacks by the radar nav computer ensures that the projected target position coincides with the ideal missile impact point at any given instant. Any deviation from the ideal situation generates an error signal in the radar nav computer which modifies the sight orders until the error signal is reduced to zero.

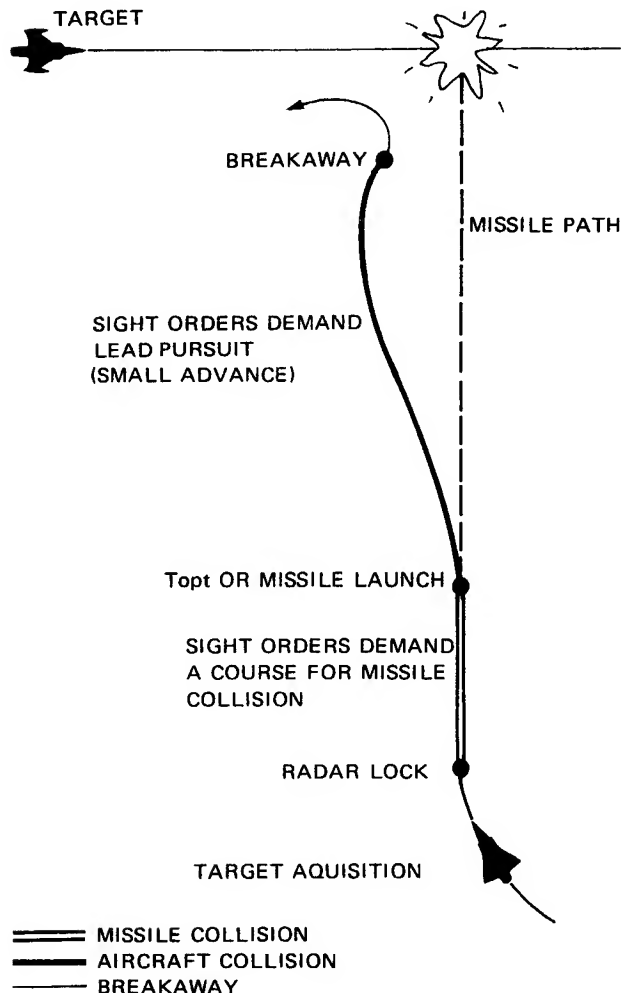
### LEAD PURSUIT NAVIGATION

The radar nav computer employs lead pursuit navigation as soon as the Matra missile is fired or at Topt, whichever occurs first or, in the case of S.W. and GUNS, at 8 NM range from the target. This is modified by a small advance which adjusts the aircraft's roll-out distance behind the target.

### NAVIGATION IN MATRA

With the weapon system selector on MISS (Matra), approach navigation (refer to Fig 1-1) is commenced as soon as the radar is locked on (amber sequence light on). Through sight orders, the target and aircraft speed vectors are manoeuvred so as to be in the firing plane and provide a missile collision course with the target. The fire zone computer continuously

## Fire Control Navigation —Matra



**Figure 1-1**

computes the predicted missile impact point with the target and illuminates the green, in-zone, sequence light (amber light out) when it computes that the target is within the missile time of flight ( $T_{max}$ ). It also computes the optimum firing point ( $T_{opt}$ ), which is defined as that point within the firing zone at which the missile has the greatest probability of kill ( $P_k$ ). The Matra computer continually adjusts the missile navigation constant ( $K$ ) to ensure that the missile flight orders are such that it achieves the optimum track to the target. The Matra computer also adjusts the missile warhead delay to suit the attack.

The harmonization box aligns the Matra and Cyrano frequencies and tracking circuits, and alerts the pilot by audio signal when the missile has locked-on to the target. The Matra may be fired when the green

sequence light illuminates and the Matra acquisition tone is heard. If AUTO-FIRE is selected, the missile fires automatically at  $T_{opt}$ . As soon as the missile is fired (either manually or at  $T_{opt}$ ), the missile gone signal is received by the radar nav computer which then adjusts the sight orders to direct the aircraft on to a lead pursuit course (with a small advance).

The fire zone computer now measures aircraft to missile range and plots this against aircraft to target range. At the time when it calculates that these ranges are equal (missile impact), or when it calculates the missile's minimum time of flight ( $T_{min}$ ), the fire zone computer signals the radar nav computer to issue breakaway orders which, if followed, direct the aircraft away from the impact area.

### Note

If the missile is not fired by the computed Optimum Firing Point ( $T_{opt}$ ), the radar nav computer issues lead pursuit sight orders (with a small advance) at that point.

### NAVIGATION IN SIDEWINDER

In S.W., if radar lock-on is achieved outside 8 NM, the radar nav computer gives the approach navigation sight orders which follow the approach missile collision course. At 8 NM, the orders are changed from approach navigation to lead pursuit navigation, with a four second advance. The sight orders direct the aircraft into the target's stern. The fire zone computer continually compares missile performance with aircraft to target range and, as soon as the aircraft is within missile range of the target, the green in-zone sequence light illuminates. Sight orders continue to be computed by the radar nav computer down to zero range.

### Note

The fire zone computer does not take into account target manoeuvres, aircraft angle-off to the target or negative closing speed.

### NAVIGATION IN GUNS

In GUNS, if radar lock-on is achieved outside 8 NM, sight orders change at 8 NM from approach navigation to a lead pursuit course, with a six second advance. This course is designed to bring the aircraft into the target's stern close to gun range. The amber sequence light remains on until 1.1 NM range is reached; at this point, the fire zone computer illuminates the green in-zone sequence light, the radar nav computer ceases to function and the sight orders disappear. The sight then becomes a radar computing gyro gunsight.

### ANTI-JAM NAVIGATION

When a jamming target is tracked in the anti-jam mode with MISS selected, the radar nav computer employs proportional navigation to compute sight orders in azimuth and elevation. The sight orders lead towards a collision course with the jamming target, ie constant bearing which results in a stern attack. Whilst the radar is locked-on to a jamming



signal, the fire zone computer and range drum are inoperative and closing speed is not available. The Matra computer gives the missile a navigation constant of 2 and a warhead delay of 80 microseconds assuming that the attack is from astern. When the target echo becomes stronger than the jamming signal, the radar nav computer computes normal Matra approach navigation, the range drum gives the range to target and the Matra missile navigation constant and warhead delay are adjusted as required. With S.W. or GUNS selected, the radar nav computer employs a lead pursuit navigation which is identical to that used in normal S.W. and gun attacks at ranges less than 8 NM. This results in the aircraft being flown towards the jammer's stern.

## WEAPON SYSTEM NAVIGATION

In the air-to-ground role, the WNS is used solely as an aircraft navigation system (refer to Fig FO 1-2). The components which can be used for navigation are the :

- Cyrano IIB with the weapons system selector in the AIR-GROUND sector,
- Gunsight,
- Doppler,
- PHI,
- TACAN, and
- Radar altimeter.

The use of the WNS in the air-to-ground role is adequately covered in DI(AF) AAP 7213.003-1 Navigation Techniques. Figure FO 1-2 shows the functions of the components of the WNS in the air-to-ground role.

## WEAPONS SYSTEM CONTROLS

The weapon system controls include those controls grouped on the weapon system control panel and the armament switches involved in the release of the various weapons (refer to Fig 1-2 and 1-3).

### Note

The R550 modified Mirage configuration includes connection of the Fuel Dipper System to the R550 firing controls. Activation of the R550 firing controls with or without missiles loaded will initiate fuel dip.

## WEAPON SYSTEM CONTROL PANEL

The weapon system control panel (WSCP) located on the right console, groups together most of the Cyrano IIB radar mode controls, the gunsight controls and the various weapons selections. The WSCP is divided into four sections. These are the:

- weapon system section,
- MISS section,
- RADAR section and,
- BOMBS section.

**[D]** The RADAR section is not fitted.

### WEAPON SYSTEM SECTION

The weapon system section is divided into AIR-AIR and AIR-GROUND sectors. When the weapons system selector is rotated from the G/S OFF position, the gunsight, camera and Matra R550 circuits are energised.

### Note

Although the weapons system selector is in the G/S OFF position, guns can be fired or bombs can be released if the GUNS or BOMBS armament switches are on.

### Air-to-Air Modes

Rotating the weapons system selector to the AIR-AIR sector selects the air-to-air functions of the radar and sight. Within the AIR-AIR sector three modes can be selected:

- MISS.** In this position, the Matra 530 weapons system and the Matra R550 electrical circuits are activated, but the R550 homing heads do not scan or lock on to IR targets. After radar lock-on, pitch and roll signals from the system's computations are presented to the pilot as sight orders which enable him to position the aircraft at the ideal firing point for the Matra.  
**[D]** This mode is not fitted.
- S.W.** When S.W. is selected, the Matra R550 missiles scan and lock on to IR targets. After radar lock-on, the radar-nav computer computes pitch and roll sight orders for a Sidewinder attack. The fire zone computer has not been reprogrammed with Matra R550 missile performance. The green fire zone light is indicative of entry into the Sidewinder firing envelope only.

### Note

If S.W. sight orders are not required, the weapons system selector may be left in GUNS.

**[D]** Matra R550 missiles may be fired after the target is acquired visually and an estimation of target range is made by the pilot. Sight orders and the fire zone light are not available.

- GUNS.** With GUNS selected, the guns weapon system computes sight orders down to 1.1 NM; the Matra R550 missile electrical circuits are also activated, but the missile homing heads do not scan or lock on to IR targets. At ranges less than 1.1 NM, the sight becomes a computing gyro gunsight with range fed from the radar. The R550 tone can still be heard and the R550 can be fired normally.

**[D]** With GUNS selected, the sight operates as a conventional gyro gunsight and computes firing information according to the altitude from the air data computer and the range set by the pilot on the manual range rheostat (200 to 1200 metres).



**Dogfight Mode**

For all weapon system selections, except G/S OFF, an additional air-to-air mode (Dogfight mode) can be selected by depressing the Dogfight button (previously referred to as the Sight Override Button). In Dogfight

mode, the Matra R550 missiles scan and lock on to the IR targets. The gunsight displays sight orders and depression for AIR-AIR GUNS. The missile seeker heads initiate a wide scan.



# III O Weapon System Controls

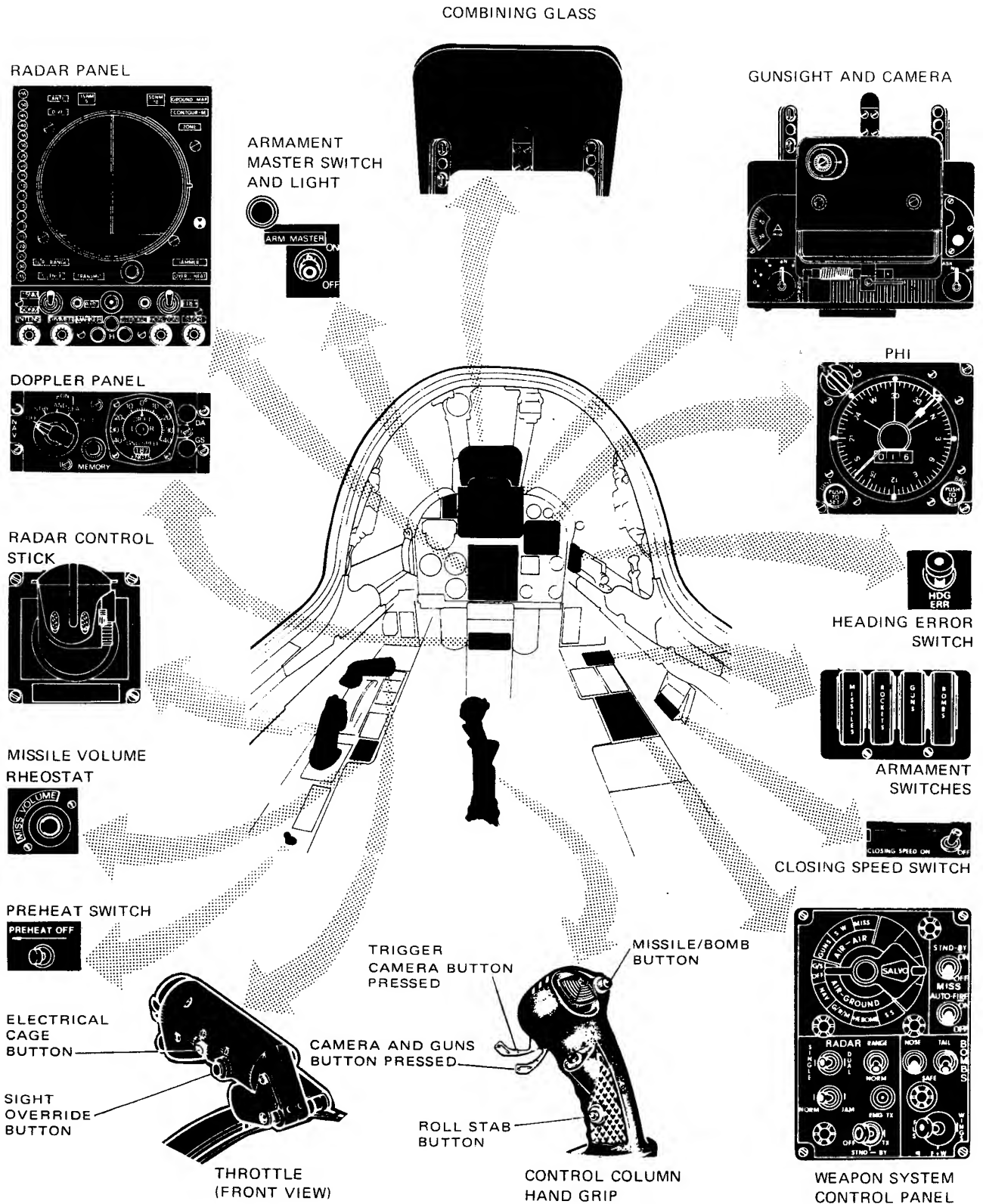


Figure 1-2

## IIID Weapon System Controls

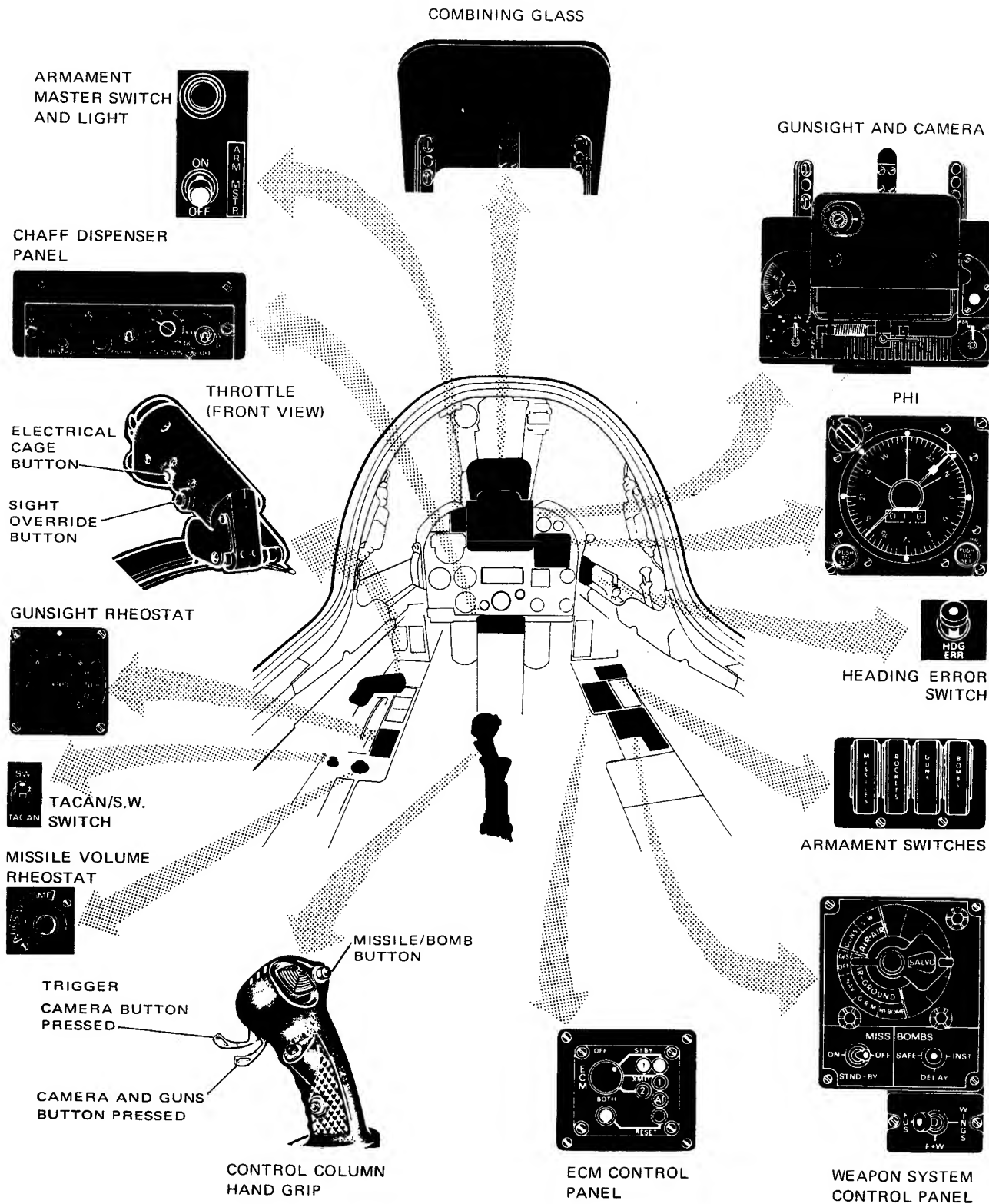


Figure 1-3

### **Air-to-Ground Modes**

Rotating the weapons system selector to the AIR-GROUND sector selects the air-to-ground function of the radar and sight. When this sector is selected, the sight depression rheostat provides adjustment of the depression angle so that the sight can be used as a reference for delivery of conventional weapons. In all air-to-ground modes, the Matra R550 electrical circuits are activated, but the missile homing heads do not scan or lock on to IR targets. The S.S. (Special Store) position is not used. Three positions can be selected as follows:

- a. **NAV.** In this mode, the sight displays aircraft attitude and heading. By selecting the heading error (HDG ERR) switch on, the moving reticule indicates to the pilot the direction (DR or TACAN) of a selected station.
- b. **G/R/M (Guns/Rockets/Missiles).** This selection depresses the sight reticule to a basic setting of 26 mils. The basic setting can be varied -5 to +45 mils by the sight depression rheostat providing depressions suitable for gunnery or bombing under certain conditions.
- c. **HE BOMB.** Selecting HE BOMB depresses the reticule to a basic setting of 111.5 mils. The basic setting can be varied -5 to +45 mils by the sight depression rheostat providing depressions suitable for bombing.

#### **Note**

In the air-to-ground mode, the radar will operate with the weapons system selector in the G/S OFF position.

### **SINGLE/SALVO Selector**

The SINGLE/SALVO selector is attached to the base of the weapon system selector. When SINGLE is selected:

- a. In the S.W. or Dogfight modes when two missiles are carried, the left-hand missile is fired first. If the selected missile has not locked-on at firing, a transfer box immediately sends a firing signal to the other missile if it is locked-on.

#### **Note**

When the aircraft is loaded with a TDU-11B target rocket on the left outboard wing station and R550 on the right outboard wing station, select SINGLE to fire the target rocket. After firing the target rocket, it is necessary to select SALVO to receive missile tone and to fire the R550 since the TDU-11B target rocket does not activate the launcher changeover relay.

- b. In the HE BOMB mode, single bombs are released from the PM-3, and a single bomb or a stick of bombs is released from the RPK10 depending on the RPK10 intervalometer setting. The SINGLE/SALVO selector has no effect on bomb release from the SUU-20A/A.

When SALVO is selected:

- a. In the S.W. or Dogfight modes when two missiles are carried, the right-hand missile is fired first.

If the selected missile has not locked-on at firing, a transfer box immediately sends a firing signal to the other missile if it is locked-on.

- b. In the HE BOMB mode, SALVO selection permits multiple bomb releases. From the PM-3, the rear bomb is released first and the front bomb is released 0.3 second later. From the RPK10, bombs are released alternately from each wing at 0.15 second intervals until the load is exhausted.

#### **Note**

When dropping bombs in a salvo or stick, the missile/bomb button must be held down until the release of the salvo or stick is complete.

### **Gunsight Brightness Rheostat**

The gunsight brightness rheostat is mounted on top of the same base as the weapons system selector and the SINGLE/SALVO selector. The rheostat is rotated anti-clockwise to give maximum sight brightness.

### **MISSILE SECTION**

The missile (MISS) section contains two gated ON/OFF toggle switches; the stand-by (STND-BY) switch and the Matra automatic firing (AUTO-FIRE) switch. The switches have the following functions:

- a. **STND-BY Switch.** The STND-BY switch operates the R550 and R530 circuitry. The STND-BY switch is a gated switch. When the STND-BY switch is selected ON, nitrogen coolant from the Matra R550 launcher is released into the missile homing head and the Matra R550 rate gyro, gyroscope and homing head modulator rotors run-up. The STND-BY switch may be selected ON at any stage during flight, but must be selected ON at least 1 minute before launch to allow missile gyro run-up and to complete homing head detector cooling. With a Matra R530 missile when the switch is selected ON, power is supplied to the missile circuits, and various alignment and preheating functions begin. The switch must also be selected ON in order to fire a MK26 target rocket.
- b. **AUTO-FIRE Switch.** The AUTO-FIRE switch is used only if automatic firing of the Matra R530K missile is desired. With the switch ON, the Matra fires automatically at Topt. The AUTO-FIRE switch may be over-ridden by the missile/bomb button.

**D** The MISS section contains the STND-BY switch only. The switch is used in conjunction with S.W.

#### **Note**

- When Matra or S.W. is carried, the STND-BY switch must be selected ON before taxiing the aircraft and left ON until just prior to engine shut down to avoid damaging the gyro assembly.
- When a training Matra missile is carried, the radar scanning program may be interrupted by the missile gone signal after firing the Matra and the radar breaks lock. To re-establish normal radar presentation, select the STND-BY switch to OFF momentarily.

## RADAR SECTION

The RADAR section, contains the following controls which affect the operation of the Cyrano IIB radar :

- a. **Radar Master Switch.** This switch activates the radar circuitry. It has three positions; OFF, STND-BY and TX.
- b. **Emergency Transmit Button.** This button, labelled EMG. TX, may be used if radar transmission fails. Pressing the button may restore transmission under certain circumstances. Pressing the button disconnects power from the modulator and allows the safety circuits to reset. Transmission will not be restored until the button is released.
- c. **Anti-jam Switch.** This switch has two positions, NORM and JAM. When JAM is selected, the radar and the Matra missile can operate in a limited ECM environment.
- d. **Range Switch.** This switch has two positions; NORM and RANGE. It may be used in both air-to-air and air-to-ground modes. When RANGE is selected, the radar operates in an automatic lock-on mode (see also Sight Override Button).
- e. **SINGLE/DUAL Switch.** This switch has two positions; SINGLE and DUAL. When selected to SINGLE, it alters the dual-plane antenna scanning program in air-to-air and Ground Map 50 modes causing the antenna to sweep in a single scanning plane. When selected to DUAL, the antenna sweeps in two planes. The exact nature of the dual scan depends on whether the radar is in the air-to-air or air-to-ground mode. The switch has no effect in Ground Map 15 mode which operates in SINGLE.

## BOMB SECTION

The BOMBS section controls the fusing and release of bombs and contains the bomb fusing switches and the bomb station selector.

### TAIL/SAFE Fusing Switch

Selecting the TAIL/SAFE fusing switch to TAIL energizes the tail fusing units which retain the arming links when the bombs are released. The tail fuses of low-drag bombs are thus armed. When high-drag bombs are released, the tail fusing units retain the arming links; the tail fuse and the bomb tail opening lanyards are withdrawn and fuse arming occurs during retardation after tail opening. With the TAIL/SAFE fusing switch selected to SAFE the tail fusing units are not energized, the tail fuse is not armed and high-drag bomb tails will not open. Therefore if both nose and tail fuses are fitted to high-drag bombs, the pilot has the option of both high and low-drag delivery modes.

#### Note

When the bombing switches are made safe during post release checks, the fusing units retain the arming links. This provides confirmation of bomb fuse arming in the event of unexploded bombs.

## NOSE/SAFE Fusing Switch

The NOSE/SAFE fusing switch is a gated switch. When NOSE is selected, the nose fusing units are energized and the bomb is armed on release. When high-drag bombs with both nose and tail fusing are carried, the nose fuse is not to be armed for low level high-drag deliveries. If the nose fuse is armed and the tail fails to open, the aircraft will be within the fragmentation envelope of the bomb when the bomb detonates. The gated construction of the NOSE/SAFE fusing switch should remind the pilot to avoid this potentially dangerous situation.

### WARNING

Do not select the NOSE/SAFE fusing switch to NOSE when making low level high-drag bomb deliveries. When the NOSE/SAFE fusing switch is selected to SAFE the nose fusing units are not energized.

**D** The bomb fusing is controlled by a single three position switch which provides fusing as follows :

- a. **INST.** Both nose and tail fusing are selected.
- b. **DELAY.** Tail fusing only is selected.
- c. **SAFE.** The fusing solenoids are not energized and the bombs are dropped safe.

### Bomb Station Selector

The selector has three positions marked FUS, F+W and WINGS. These positions have the following effect :

- a. **FUS.** Only bombs on the centreline station can be released.
- b. **F+W.** This position can only be used with the SINGLE/SALVO switch in SALVO. With bombs on the PM-3 and each RPK10 outboard station, the rear bomb on the PM-3 is released immediately the missile/bomb button is pressed. The front bomb on the PM-3 and the first bomb from the left RPK10 are released 0.3 seconds later. The remaining bombs are then released from alternate RPK10 stations at 0.15 second intervals.
- c. **WINGS.** Only bombs on the underwing RPK10 tank/bomb carriers can be released.

#### Note

- With the SINGLE/SALVO switch in SINGLE and F+W selected, no bombs will be released from the aircraft.
- FUS must be selected to release BDU-33 practice bombs from the SUU-20A/A dispenser. With F+W selected, no bombs can be released from the SUU-20A/A dispenser.

## ARMAMENT CONTROLS AND INDICATORS

There are additional switches in the Mirage weapon systems other than those grouped on the WSCP. These include the :

- ARM MASTER switch,
- selective armament switches,
- trigger,
- missile/bomb button,
- sight depression rheostat,
- electrical (elec) cage/boresight button,
- dogfight button,
- MISS VOLUME control rheostat, and
- PREHEAT switch.

☐ The PREHEAT switch and sight override button are not fitted but a manual ranging rheostat is added.

### Armament Master Switch

This is a two position toggle switch labelled ARM MASTER located on the upper left portion of the instrument panel. All armament circuits are de-activated when the ARM MASTER switch is selected OFF. The switch must be selected ON to fire or release a weapon.

### Armament Master Light

The armament master light located above and to the left of the ARM MASTER switch illuminates when the switch is selected ON but this does not necessarily indicate that the armament circuits are energized.

☐ An armament master light is also located in the rear cockpit.

### Selective Armament Switches

The selective armament switches are four guarded switches located on the forward section of the right console. They select the weapons circuitry which is activated when the ARM MASTER switch is selected ON. From left to right they are labelled MISSILES, ROCKETS, GUNS and BOMBS and select the following weapons :

- MISSILES.** Matra, S.W., and target rocket,
- ROCKETS.** No application,
- GUNS.** Defa gun, and
- BOMBS.** MK82 and BDU-33 bombs.

### Trigger

The first pressure on the trigger operates the gunsight camera provided the weapons system selector is in any position except G/S OFF. The second pressure fires the guns (and the camera continues to operate) provided both the GUNS and the ARM MASTER switches are ON. When the trigger is released, the camera runs a further 0,2,5 or 5,0 seconds depending on the camera overrun setting.

### Note

First pressure trigger movement is small, but with practice the gunsight camera may be easily operated without inadvertently firing the guns.

### Missile/Bomb Button

The missile/bomb button on the control column hand grip must be pressed to release MK82 or BDU-33 bombs, and to fire R530, R550, or the target rocket. The function of the button is determined by the weapon system selector. The gunsight camera operates while the missile/bomb button is pressed. When the button is released, the camera runs a further 0, 2.5 or 5.0 seconds depending on the camera overrun setting.

### Sight Depression Rheostat

The sight depression rheostat enables the sight reticule depression to be varied  $-5$  to  $+45$  mils around the respective basic settings in the AIR-GROUND modes.

### Electrical Cage/Boresight Button

The electrical cage/boresight button (refer to Fig 1-4) is the recessed (inboard) button on the front of the throttle handle. In the AIR-AIR GUNS or Dogfight mode when the radar is not locked on, pressing the button fixes the sight sensitivity current at the equivalent of 3.5 hm radar range. When the radar is locked on and the radar range is 6 hm, the sight sensitivity in electrical cage is 3.5 hm. At radar ranges greater than 6 hm, the locked-on electrical cage sensitivity is proportionally greater than 3.5 hm and at ranges less than 6 hm the sensitivity is proportionally less than 3.5 hm.

If either S.W. or Dogfight modes are selected and Matra R550 missiles are carried, pressing the button also reduces the missile homing head to narrow scan. When the button is pressed, the homing head unlocks and after 0.3 seconds relocks to any IR target within its reduced scan field of view. The narrow scan search pattern can be considered as missile boresight. The homing head resumes wide scan as soon as the electrical cage/boresight button is released.

## Throttle Handle

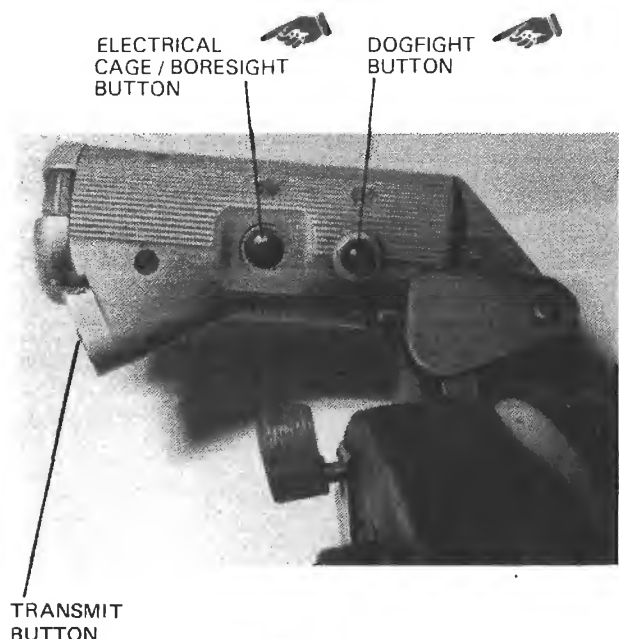


Figure 1-4

**Dogfight Button**

The Dogfight button is the raised (outboard) button on the front of the throttle handle. Dogfight mode can be selected by pressing this button when the weapons selector is in any position except G/S OFF. When the Dogfight button is pressed, Matra R550 missiles (if carried) commence a wide scan and will lock on to any IR targets within their field of view. At the same time, the gunsight switches to AIR-AIR GUNS mode. While the Dogfight button is held in, the radar scans in AIR-AIR range. When the button is released, the radar remains locked on or reverts to AIR-AIR sweep if a lock-on is not taken. Deselection of the Dogfight mode is achieved by depressing the Dogfight mode light on the LH instrument glare shield, or by rotating the weapon system selector to another position. When Dogfight mode is deselected after a radar lock has been taken and the weapons selector is in the AIR-AIR sector, the radar retains the lock. If an AIR-GROUND mode is selected, the radar breaks lock on deselection of Dogfight mode and the radar resumes normal air-to-ground sweep. Selection of Dogfight mode initiates all MISS STBY functions regardless of the position of the MISS STND-BY switch.

**Missile Volume Control Rheostat**

The MISS VOLUME control rheostat is located on the left console. The rheostat controls the volume of the Sidewinder IR tone or the Matra firing and masking tone to the headset. The R550 lock-on tones can only be heard when S.W. or Dogfight modes are selected.

**Preheat Switch**

This switch is located at the rear of the left console.

It has two positions, labelled PREHEAT and OFF. It was designed to be used in conjunction with the GAMO II external power supply. The GAMO II has been withdrawn from service. When the switch is selected to PREHEAT, external power is used to:

- heat the R530 and/or R550 missile battery,
- preheat the Cyrano radar,
- supply heating voltage to the R550 gyro,
- operate the gyro reference system, and
- supply power to the telebrief circuits.

If PREHEAT is selected whilst operating on normal AC or DC external power sources, the main AC and DC electrical bus bars do not receive power. However, the TGP receives power and can be operated normally.

☐ The PREHEAT switch is not fitted.

**☐ Manual Ranging Rheostat**

This rheostat, located on the left console, controls the sight sensitivity in the air-to-air guns mode from 200 to 1200 metres.

**Missile Lock On Lights**

Two amber missile lock-on lights are located on the LH instrument glare shield (refer to Fig FO 1-1, 1-3).

**Dogfight Mode Light**

A green Dogfight mode light is located on the LH instrument glare shield between the two missile lock-on lights. The Dogfight light is illuminated whenever the Dogfight mode is selected. This mode can only be deselected by depressing the light or by rotating the weapon system selector to another position.

**WEAPON EMPLOYMENT****AIR-TO-AIR WEAPON EMPLOYMENT**

Every attack can be considered in several phases, depending on how the weapons fire control system is used. These are the :

- pre-take-off phase,
- ground controlled phase,
- search phase,
- lock-on phase,
- tracking phase,
- tracking after firing phase (Matra only) and
- breakaway.

**PRE-TAKE-OFF PHASE**

Before take-off, the pilot carries out the following weapons system checks :

- gunsight and gun camera check,
- missile checks,
- air-to-air radar checks.

When the aircraft is scrambled from alert, radar checks are done during the ground controlled phase.

**GROUND CONTROLLED PHASE**

In this phase, the aircraft is guided to the vicinity of the target by means of the ground radar or other means. The pilot performs the pre-firing checks for the appropriate weapon (refer to Sect 2) and pre-sets the radar controls as follows :

- Antenna elevation — As required.
- Manual gain control knob — Maximum
- PHI mode selector (strobe position) — ANT AZ.
- Antenna scan selector — 60.
- Range scale switch — 50 NM.
- SINGLE/DUAL switch — As required.
- Range switch — NORM.
- Anti-jam switch — NORM.
- Radar master switch — TRANS (or STND-BY if required).

**Note**

- If possible, carry out a functional check to ascertain radar serviceability.
- When practicable, each S.W. missile should be boresight checked against the fixed cross to ascertain its exact aiming point.



### SEARCH PHASE

This phase begins when the aircraft is within airborne radar range of the target and ends when the radar is locked-on. During this phase, the pilot devotes most of his attention to the scope in order to find the target echo as early as possible. The pilot should :

- Set the desired antenna angle on the PHI after selecting ANT AZ.
- Set the strobe range 3-4 NM below the range given by GCI.
- Use 60 scan initially, then switch to 30 scan when the target position is known.
- Set antenna elevation as directed or as calculated.

The use of the flying aids is recommended to reduce pilot workload and allow maximum attention to the radar. Changes in aircraft attitude or altitude introduce antenna elevation errors and make target detection and lock-on difficult. The scope A/H may be used to help maintain the required aircraft attitude. On a planned intercept, the required IAS/IMN must be flown to maintain the correct intercept geometry. Maximum attention must be given to the radar scope but the flying aids can disengage without warning.

Therefore at night or in IMC, it is essential to refer to the flight instruments to maintain aircraft control, especially at low altitudes.

### WARNING

- Under conditions of high workload during radar search, maintenance of aircraft control must take priority.
- Altitude lock or roll stab may disengage without warning.

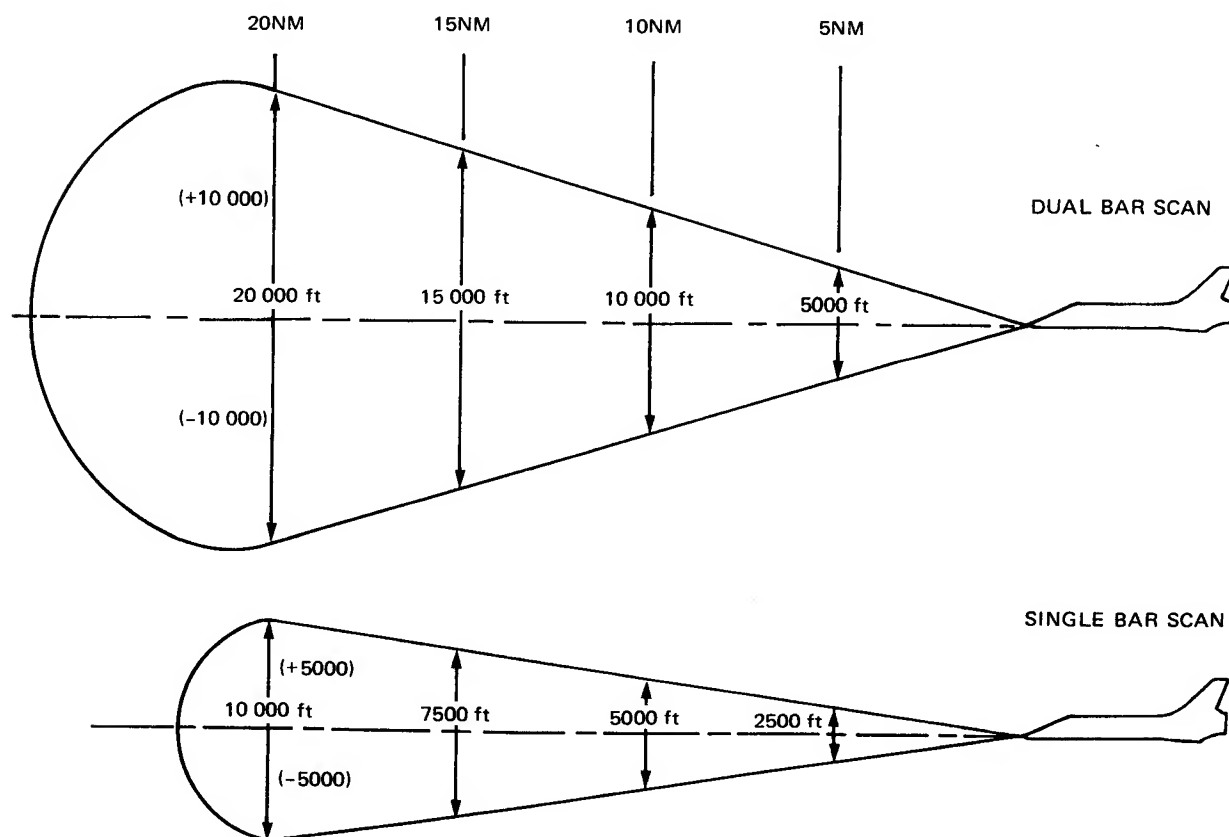
### Altitude Coverage

Figure 1-5 shows the antenna altitude coverage at various ranges in 27 NM scope and both dual and single bar scan. If target altitude is known, the antenna should be positioned as calculated using the formula :

$$\text{Antenna elevation} = \frac{\text{Height difference (100 ft)}}{\text{Range (NM)}}$$

For example, if the height difference is +5000 ft and range is 10 NM, the antenna elevation is +5°.

## Altitude Coverage



**Figure 1-5**

### Antenna Search

If the target altitude is not known, a systematic search in elevation must be made with the SINGLE/DUAL switch in DUAL, ie dual bar scan. A suggested method which ensures an overlapping search is as follows :

- Searching Upwards.** Press the up antenna elevation control button to raise the antenna  $2\frac{1}{2}^\circ$  each time the radar sweep reaches the right side of the scope.
- Searching Downwards.** Press the down antenna elevation control button each time the radar sweep reaches the left side of the scope.

The search time may be reduced by pressing the appropriate antenna elevation control button each time the radar sweep reaches both the right and left sides of the scope but this method does not provide a search overlap.

### Azimuth Search Methods

The pilot may select either  $60^\circ$  or  $30^\circ$  scan for azimuth search. If target position is known or GCI information is consistent,  $30^\circ$  scan should be used as detection capability is improved. If the target evades or doubt exists as to target position,  $60^\circ$  scan should be used.

Two methods of radar search are used :

- Automatic Search.** Automatic search is normally carried out with dual bar scan selected. However, under some conditions, eg at low level, single bar scan reduces radar clutter and facilitates radar interpretation.
- Manual Search.** Contact ranges can be improved by operating either the break lock lever or lock-on lever. This concentrates the radar energy into a  $5^\circ$  beam, which can increase radar contact range by up to 5 NM, provided the antenna elevation is correct. It may be necessary to move the scope stop program left or right slightly to allow for small GCI azimuth errors (refer to Fig 1-6).

#### Note

If the lock-on lever is used during manual search, an undesired lock-on may occur, eg when flying at low level, lock-on to the ground can occur.

### Use of Manual Gain

In both search methods, the use of manual gain may facilitate target contact by reducing general background noise and contrasting the brighter target echo. This applies particularly to low level intercepts.

## Manual Search

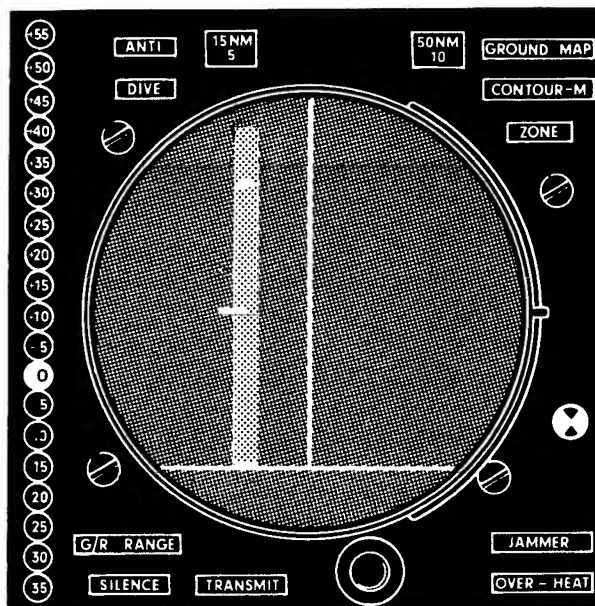


Figure 1-6

### No Contact

If no contact has been made and the target range is less than 5 NM, select 6 NM scale,  $60^\circ$  scan and use the GCI target azimuth information as a command heading. A search in antenna elevation may achieve a radar contact.

#### Note

To prevent overtaking the target during a stern intercept with high closing speed, the aircraft's speed should be reduced to target speed inside missile range or, if this is not practicable, a further attack should be commenced.

### Weapons System Operation

During the search phase, the weapons system operates as follows :

- The antenna scans according to the selected scan mode (refer to Fig 1-7) and is stabilized in pitch and roll in the  $60^\circ$  scan mode, and pitch, roll and heading in the  $30^\circ$  or spiral scan mode.
- The mean antenna elevation is indicated by the elevation lights to the left of the scope.
- The scope displays the complete radar picture of the search area. Target echo positions are indicated according to the position computed by the receiving circuits.
- The strobe is presented on the scope in the position pre-determined by the pilot, using the radar control stick.

## Search — 60 Scan

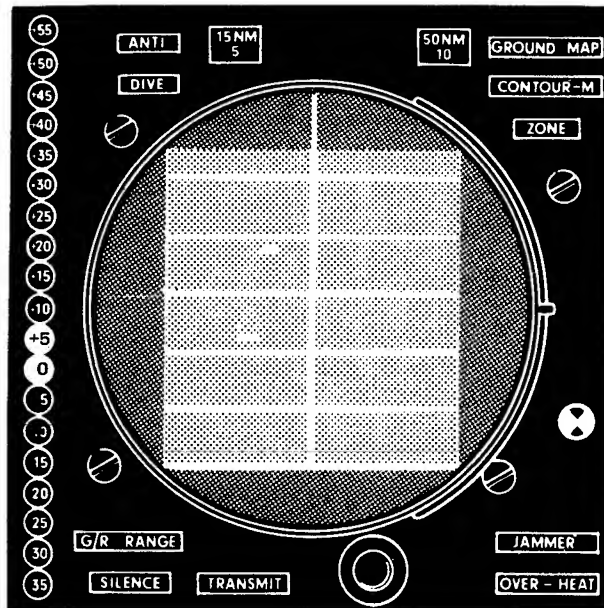


Figure 1-7

## 30 Scan — Prior to Lock-on

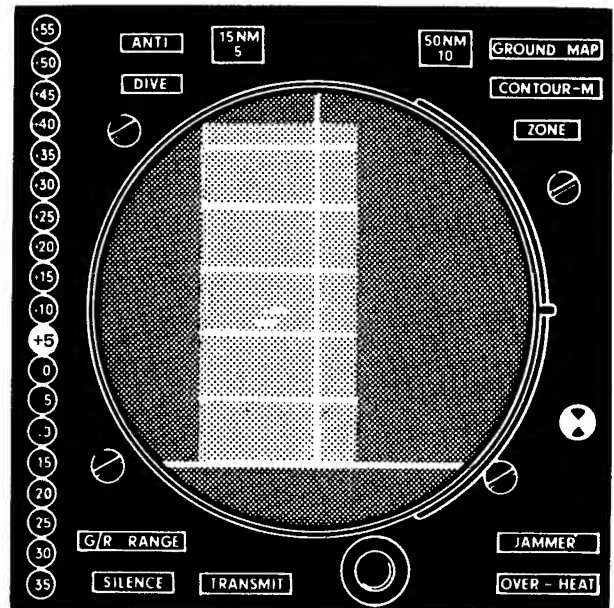


Figure 1-8

### LOCK-ON

#### Manual Lock-on

To achieve manual lock-on, use the radar control stick to position the strobe just short of the target with the right edge of the strobe in line with the centre of the target (refer to Fig 1-8). Pressing the lock-on lever (either direct or wobblating) achieves lock-on, provided the target is painting in both sweeps. If the target echo is painting in only the bottom sweep, lower the antenna. Raise the antenna if the target echo is painting in the upper sweep. In the case of high closing rates (with the target above the aircraft), the antenna should be adjusted so that the target echo is strongest in the lower sweep and the strobe positioned slightly shorter in range. This allows for target motion during lock-on. The reverse should be applied with the target below the aircraft.

#### Automatic Lock-On

Automatic lock-on occurs as follows :

- Spiral.** Provided antenna elevation is correct, automatic lock-on occurs when the strobe is positioned so that the target echo is within the strobe wobblating and inside 21 NM.

- Range.** With the range less than 2.7 NM and the aircraft positioned so that the target is just above the fixed cross, an automatic lock-on occurs.

When using Matra, it is essential to achieve radar lock-on as soon as positive contact is established particularly when a late contact and a high closure rate is involved. This allows the maximum time for the missile to align and lock-on to the target. For any other attack, the experienced pilot, having a thorough knowledge of the attack geometry, may attack using the scope once he has positive radar contact.

When the radar is locked-on (refer to Fig 1-9), the following indications appear :

- the amber lock-on light illuminates;
- the antenna elevation lights extinguish;
- the target appears in the scope stop program coincident with the strobe;
- range markers appear in the stop program;
- the stop program follows the antenna movement; and
- the sight orders give target range, target closing speed and the solution to the weapon navigation problem.

## Radar Locked On

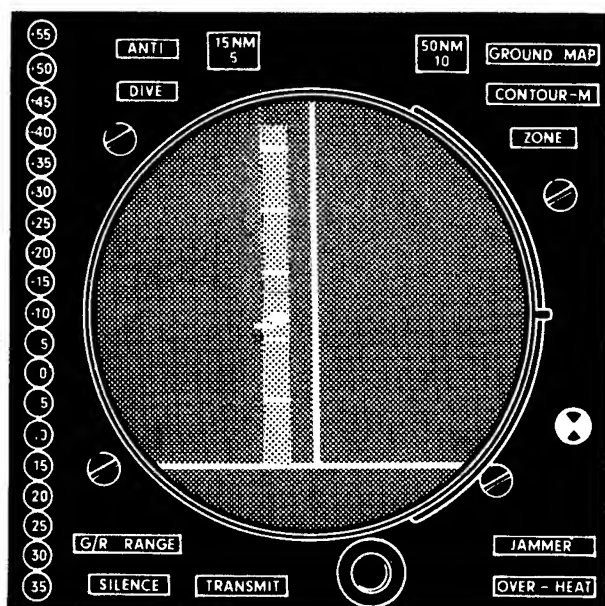


Figure 1-9

### Lock-on — Noise Jamming

Lock-on to a noise jammer is possible and the Matra may be launched in the Home-on-Jam (HOJ) function.

The following techniques should be used :

- With the use of antenna elevation and manual gain, isolate the strongest jamming strobe. A reduction in gain may also make the target visible in the jamming strobe.
- If the target is visible, attempt a normal lock-on. If lock-on is achieved, complete a normal pass monitoring the scope.
- If the target is not visible, select anti-jam, position the range strobe over the jamming strobe and press the lock-on lever. The radar locks-on in azimuth and elevation. The stop program fills in with noise and the strobe wobbulates between 2.5 hm and 16 NM.

#### Note

- Select full gain after lock-on to ensure the best possibility of achieving a burn through. The manual gain control continues to function until range lock-on is achieved.

- If the radar subsequently locks-on in range, the radar and sight presentation operate in the normal mode. However, with the anti-jam switch selected to JAM, the gunsight gives erroneous indications in the AIR-AIR GUNS mode.
- If range lock-on is not achieved, the target range can be determined using angle range techniques, ie

$$R = \frac{\Delta H (100 \text{ ft})}{\text{Antenna elevation (degrees)}}$$

### TRACKING PHASE

This phase begins with radar lock-on and ends with missile launch. The exact sequence of events depends on the missile selected.

### MATRA R530K ATTACK

A Matra attack (refer to Fig FO 1-3) may be made visually or by using instruments, but radar lock-on is essential. The radar must be both range and angle locked for a normal attack, or angle locked for an attack on a noise jamming target.

Immediately the target is acquired :

- correct any errors in intercept geometry to ensure that minimum manoeuvring is required to cancel sight orders,
- lock-on as soon as practicable, and
- mentally note the final intercept geometry for possible re-attack planning.

On a frontal attack with high closure rates, it is essential to accurately position the strobe in azimuth, ie right edge under centre of target, and to slightly lead the antenna elevation to ensure that lock-on is achieved without delay.

#### Note

Correct radar lock-on should be confirmed by radar scope indications as well as by the amber lock-on light.

### After Radar Lock-on

After radar lock-on, the sight orders give steering commands to ensure a missile collision course. The roll orders must be cancelled, preferably with the aircraft in level flight, to ensure the maximum chance of missile success. When manoeuvring to cancel sight orders, it is essential to fly smoothly as the sight presentation is sensitive to over-controlling. Figure FO 1-3 A to D shows the sight presentation while cancelling roll orders. Once roll orders are cancelled, pitch orders should be cancelled (refer to Fig FO 1-3 E) and the pilot then waits for the green fire zone

light and Matra lock-on tone. During this period the pilot updates antenna elevation to prepare for a possible break-lock.

**Note**

In certain cases, eg when intercepting targets at high altitude where aircraft performance is marginal, it may be advantageous to delay cancelling sight orders until the aircraft is within the fire zone. This preserves aircraft performance and ensures that the missile minimum launch parameters can be met.

**Fire Zone**

Entry into the fire zone is indicated by the green fire zone light on the sight head. When it illuminates the amber lock-on light extinguishes. The pilot should also be aware of fire zone ranges as the fire zone light is inoperative when firing in the HOJ mode against a noise jamming target. Various fire zone considerations and dimensions are contained in Section 1, MATRA.

**Note**

If the aircraft has a negative closing rate, the fire zone light gives optimistic indications.

**Missile Lock-on/Mask Tone**

After radar lock-on, the missile homing head is slaved to the radar antenna. Since the missile look angle is limited to 40° from its axis the radar antenna must be maintained within 40° of its axis to ensure the missile can acquire the target.

When the missile acquires the target, lock-on is automatic and is indicated by a continuous 800 Hz tone in the headset. The minimum time between radar lock-on and missile lock-on varies between one and six seconds.

Missile lock-on range depends on target aspect, total reflecting area and radar/missile performance. If the target is obscured from the missile by the aircraft, ie missile masking, an intermittent 800 Hz tone is heard and the aircraft attitude must be changed to bring the target into missile view.

**Note**

The green fire zone light normally illuminates before the Matra locks-on (Matra tone), but on a stern attack or with a large radar target the Matra may lock-on before entry into the fire zone.

**Firing**

Prior to firing, the pitch orders should be led by about 10-15 mils (refer to Fig FO 1-3 F) to enhance the chance of missile success.

Before firing ensure :

- a. Matra acquisition tone (continuous 800 Hz) is audible,
- b. sight roll orders are cancelled, preferably with the aircraft in level flight,

- c. sight pitch orders are led by 10-15 mils,
- d. the green fire zone light is on and the range indicates the aircraft is in the fire zone, and
- e. the blue light is on, indicating all switches are correct.

The Matra may be fired when the preceding conditions are met, however the best Pk is achieved by firing the missile at T<sub>opt</sub> which is about 2/3 into the fire zone.

**Note**

- At T<sub>opt</sub> the sight presentation changes to give a lead pursuit course. This change may be noticeable and indicates the optimum firing point.
- Continuing to T<sub>opt</sub> before firing may prejudice the change of success if the target is to be attacked again.

The missile can be fired as follows :

- a. **Automatic Firing.** For automatic launch, the AUTO-FIRE switch must be ON. The missile is launched at T<sub>opt</sub>, not when the fire zone light comes on.
- b. **Manual Firing.** With the AUTO-FIRE switch OFF, the missile is launched by pressing the missile/bomb button. If the AUTO-FIRE switch is ON, the missile can be launched manually by pressing the button before T<sub>opt</sub> is reached.

**Firing When Target Manoeuvres**

The Pk against a manoeuvring target, which is dependent upon the type of manoeuvre and the direction of attack, is small. The chances of a successful attack against a manoeuvring target can be increased if the target position is 'predicted'. To predict the target position when firing without visual contact, the pilot should lead sight orders in both pitch and roll. If a visual contact is made, the aircraft should be aimed ahead of the estimated missile collision point. The pilot should then reduce 'g', roll the wings level and, providing the missile is locked-on and within the fire zone, fire the missile while still leading sight orders. Firing at close range is considered to give the best Pk for a manoeuvring target.

**Tracking After Firing**

When the missile is fired or at T<sub>opt</sub>, whichever occurs first, the sight orders command a lead pursuit course. The lead collision course provides radar illumination for the missile during flight while allowing aircraft/target separation. The illumination is maintained until computed missile impact time or, if the missile is not fired, until T<sub>min</sub> after which breakaway orders are presented. The maximum preset overrun on the gunsight camera is 5 seconds. The missile time of flight is normally greater than 5 seconds, therefore if a film record up to impact is required, the missile/bomb button must be held down until impact.

### Breakaway

Breakaway information (refer to Fig FO 1-3 G) is presented as a maximum roll indication in the direction of target origin with all the gunsight indicator lights extinguishing. Complying with the sight orders ensures that breakaway is perpendicular to the firing plane. Breakaway should be at maximum 'g' loading, and should be flown by referring to the aircraft flight instruments.

#### Note

Immediately breakaway is initiated, the pilot is to fly either visually or by referring to the flight instruments.

### Limitations

During breakaway with the radar locked-on, the red limits exceed sequence light illuminates if the pilot exceeds certain limitations (refer to DI(AF) AAP 7213.003-1 Sect 1 RADAR OPERATION SEQUENCE LIGHTS). To prevent the aircraft limits being exceeded or a dangerous situation developing, instrument cross reference should be maintained.

### MATRA R550 ATTACK

A Matra R550 attack (refer to Fig FO 1-4) can be made visually or by referring to instruments with or without a radar lock-on. The missile can be fired in cloud if the missile homing head locks on to the IR target. Radar lock-on is not a pre-requisite for an R550 attack but, if lock-on is required, it is made prior to missile launch.

#### Approach and Radar Lock-On

After lock-on, the sight orders command a proportional navigation course, as for a Matra R530 attack, down to 8 NM. The aircraft points well ahead of the target and a missile-to-target collision course is maintained. At 8 NM, the navigation law changes to a lead pursuit course with a 4 second advance. The change in sight orders is most noticeable at this point because the orders demand a turn towards the target. Sight orders should be cancelled and complied with to close with the target on the lead pursuit course. During the later stages of the approach, the target should be visible within the moving reticle to the right or left of the fixed cross depending on the direction of attack. If the target is not visible and the aircraft is within the firing envelope, the missile should lock on to the IR source in wide scan. In IMC, target acquisition is severely degraded. Target lock-on will most probably be possible in conditions of reduced visibility only.

#### Note

Matra R550 missiles are nominally harmonized 39 mils above the top of the vertical arm of the fixed cross or 1 mil below the AIR-AIR GUNS pipper. When airborne, individual missile harmonization should be checked in boresight scan.

#### Approach Without Radar Lock-on

Approach to the target without lock-on is preferable since target evasion is more easily detected and the approach is less likely to give the target electronic warning of the attack. The aircraft should be

positioned accurately in the fire zone and radar antenna elevation used to determine target altitude.

During the initial stages of a Matra R550 attack, the weapon system selector should be rotated to any setting except G/S OFF or S.W. and the Dogfight mode deselected. This prevents Matra R550 missiles from locking on to spurious IR targets. Dogfight mode should be selected for missile lock-on at least 2 seconds before launch.

Missile lock-on can be accomplished in either wide or narrow scan depending on whether discrimination between IR targets is required.

#### Firing

Visual acquisition of the target before firing is most important due to the short ranges over which the Matra R550 can be fired. When firing without a radar lock-on, the range of the target must be estimated visually. If a lock-on is required, place the target at the top of the vertical arm of the fixed cross and depress the Dogfight button until a lock-on is achieved.

#### Note

Inside 1.1 NM target range when operating in Dogfight mode, the gunsight range drum gives an accurate range in hectometres.

As the Matra R550 requires no target illumination, breakaway may be initiated immediately the missile is launched. The gunsight does not generate break-away orders, so the manoeuvre must be executed visually or with reference to flight instruments.

If the Dogfight mode is selected, an R550 attack can be discontinued at any stage in favour of a guns attack. AIR-AIR GUNS information is displayed in the gunsight and, providing the GUNS and ARM MASTER switches are ON, the guns can be fired using the trigger.

If possible, a minimum firing altitude of 200 ft AGL should be observed to prevent missile impact with the ground after launch. Under ideal conditions, it may be possible to fire as low as 50 ft AGL against a co-altitude target.

#### Note

If training missiles are carried, the missile system must be 'recycled' after every one or two simulated launches, depending on whether one or two training Matra R550s are carried. Recycling is achieved by cancelling the Dogfight mode or by rotating the weapon system selector to another setting.

On subsequent reselection of Dogfight or S.W., the R550 training missile(s) come back on line after a delay of up to 34 seconds.

Two methods of firing are possible:

- a. **SINGLE Selected.** When the button is pressed, the left-hand R550 missile is launched. The pilot then hears tone from the right-hand R550 missile. The right-hand missile can be launched by pressing the button a second time.

- b. **SALVO Selected.** When the button is pressed, the right-hand R550 missile is launched first followed automatically by the left-hand R550 missile two seconds later.

As S.W. require no target illumination, breakaway may be initiated immediately the missile is launched. The gunsight does not generate breakaway information, so the manoeuvre must be executed visually or with reference to flight instruments.

#### **AIR-TO-AIR GUNNERY**

A typical air-to-air gun attack performed from a lead pursuit curve is shown at Fig FO 1-5.

#### **Air-to-Air Range Finding**

The pilot may lock-on manually or use the air-to-air range function to achieve an automatic lock-on. Air-to-air range finding is used when visual contact is achieved prior to radar contact. It can be used if the radar unlocks during a gun pass after an unsuccessful missile attack. The radar can be switched to the air-to-air range function by :

- a. pressing the sight override button on the throttle handle, or
- b. selecting the NORM/RANGE switch to RANGE.

Automatic radar lock-on is achieved by manoeuvring the aircraft to place the top of the fixed cross on the target. The centre of the radar search pattern is 4 mils above the top of the fixed cross. The target range must be between 2.5 hm and 2.7 NM. Once lock-on is achieved the radar holds lock to the limit of the antenna look angle and down to the range limit of about 2 hm. If it is undesirable to lock-on, the attack should be completed using the 6 hm sight idle or 3.5 hm electrical cage function of the gunsight.

#### **Note**

A target fitted with modern electronic counter-measure equipment can cause erroneous range information to be fed to the gunsight.

#### **After Radar Lock-on**

After lock-on, sight orders command a proportional navigation course until 8 NM. At 8 NM, the navigation law changes to lead pursuit with a 6 second advance. This provides a similar approach path to the sight orders in S.W. but with a closer roll-out range. Target position during this phase is similar to that for a S.W. attack.

At 1.1 NM, the navigation computer ceases to function and the roll bars are masked. At the same time, the fire zone light illuminates, the amber lock-on light extinguishes and the range dial changes to read in hectometres. If the closing rate is greater than 50 m/sec (about 100 KIAS), the gunsight lights flash amber/green. The sight change at 1.1 NM in AIR-AIR GUNS is known as sight changeover. At sight changeover, the pipper moves towards the electrical cage position then drifts back along a line determined by the aircraft's turn vector. From 20 to 12 hm, the gunsight computes the correct lead for a

target at 12 hm. At ranges below 12 hm, the gunsight computes for the actual range as measured by the radar.

#### **Note**

- If the radar is off-line or not locked-on, the sight computes aiming corrections for 6 hm, or 3.5 hm if the elec cage button on the throttle is pressed.
- If the anti-jam switch is in JAM, sight changeover does not occur. The range drum continues to indicate NM, the wings remain visible and gunsight lead information is erroneous.

#### **Tracking**

When the range is less than 12 hm and the target has been tracked steadily for 1-2 seconds, the sight will be computing correctly. It is essential that the build-up of 'g' during the approach to the target is smooth and constant. This ensures correct gunsight prediction for the firing problem and assists in achieving accurate tracking.

#### **Firing**

A full gunpack gives about 6 seconds of gun firing. The maximum effective range of the gun and gunsight installation is about 10 hm but best results are obtained by firing at ranges less than 6 hm.

The gun depression angle is such that when firing under 'g', the pilot has the impression of aiming the aircraft well ahead of the target. For a straight and level pass at speeds of about 500 KIAS and below, the gun depression angle results in the sight orders giving commands which lead the aircraft below the target. Hence at low altitude, an attack from above the target is desirable. At high IAS and hence low angles of attack, this situation is reversed and a level attack does not result in descent below the target.

After firing, the pilot should positively reposition the aircraft to avoid overshooting the target. A positive breakaway will also ensure the aircraft does not fly through debris. No breakaway information is presented by the gunsight. During breakaway, the radar remains locked-on until antenna limits are exceeded. The radar then returns to the selected scan mode.

#### **Visual Range Estimation**

It may be undesirable to use radar for a gun attack because ECM transmissions from the target or low altitude ground lock-ons may cause erroneous range information to be fed into the sight. If the use of radar is undesirable or if the radar is not operating, the attack can be made using visual range estimates and the fixed gunsight ranges of 6 hm sight idle and 3.5 hm electrical cage. The range can be estimated using the 50 mil reticule or 1 rad equals 25 mils. When using the gunsight with the radar unlocked, the pipper provides correct lead only under steady 'g' conditions and when the target is at 6 hm (sight idle) or 3.5 hm if electrical cage is used. To solve the fire control problem at any other range or for changing ranges, the pilot must provide additional compensation.



To estimate the target size from the reticule at 6 hm the approximate rule is :

$$\text{Mils subtended by target} = \frac{\text{Target wing span (ft)}}{2}$$

## AIR-TO-GROUND WEAPON EMPLOYMENT

The Mirage III aircraft is limited to manual delivery of air-to-ground weapons using pre-computed delivery parameters and manual sight settings. Level, low angle or high angle attacks can be made visually and level radar attacks can be made using instrument flying techniques. Bombing accuracy is largely dependent on forecast wind accuracy and pilot skill in achieving the pre-computed release parameters. Increased bombing accuracy can be achieved by using laser guided bombs.

Sample planning problems for air-to-ground weapon delivery are contained in Section 5. The controls involved in weapon delivery are described in Section 1, WEAPON SYSTEM CONTROLS. The appropriate switch settings for attacks using the various weapons and suspension units are contained in Section 2. The detailed operation of the various weapon release systems is contained in Section 1, WEAPON RELEASE SYSTEMS.

## LEVEL BOMBING

Level bombing can be accomplished within the available depression limits of the gunsight. The level attack from low altitude is suited to the delivery of fire bombs, CBU or high-drag general purpose bombs. This type of delivery is not suited to low-drag weapons (except fire bombs) because of inherent inaccuracies and safe escape problems.

The level attack from medium altitude provides a satisfactory method of delivering laser guided bombs, as the inherent errors of the level bombing pass can be greatly reduced by the terminal guidance capability of the bomb.

The ground mapping radar can be used to identify and attack suitable targets. The bomb release point can be determined using a timed run from a suitable radar offset, or by timing from 5 NM to run to the target. With a high degree of expertise and a suitably calibrated system, accuracies acceptable for CBU deliveries can be attained.

## DIVE BOMBING

Rockets, finned fire bombs, low-drag and high-drag bombs, laser guided bombs, and CBU weapons may be delivered in dive angles varying from 5° to 60°. The choice of the dive angle is dependent upon the target, terrain, weapon and fusing, weather and enemy defence systems.

The dive bombing attack from medium altitude is an excellent method of delivering low drag, laser guided bombs. The inherent advantages of the dive bombing pass over the level bombing pass are further enhanced by terminal guidance bombs.

The gunsight reticule is used as a sighting reference for high angle bombing using the AIR-GROUND G/R/M or HE BOMB modes. The fixed cross is a suitable sighting reference for some low angle attacks. Normal dive bombing techniques apply.

The aircraft accelerates rapidly in a dive even when carrying external stores. If strong tail winds cause a steeper dive angle than that planned and the pilot attempts to correct the sight placement by 'bunting', the reduced angle of attack accentuates the acceleration. At high dive angles, this effect can prejudice the safe recovery of the aircraft. The situation may be avoided by careful planning of roll-in and initial sight placement parameters (refer to Section 5).

## TOSS BOMBING

Toss bombing provides a method of delivering low drag bombs which enhances survivability and maximizes surprise. The technique consists of a low-level, high-speed run-in and pull-up to a predetermined climb angle at a designated range from the target. The bomb is released at the appropriate altitude, leaving the aircraft free to breakaway to low level and leave the defended area. The advantages of terminally-guided weapons in this type of delivery are self-evident, and the pass can be used in low cloud base conditions, providing there is sufficient time for the bomb to guide to the target once it is below the cloud base. Accurate definition of the pull-up point requires the use of an initial point, from which a timed run at a pre-planned TAS is made. The ground map radar can be used to help determine the pull-up point against a target such as a ship. Due to the limited capability of the Mirage in a toss bombing pass, a very high degree of flying accuracy is required as relatively minor errors in airspeed and climb angle result in large miss distances. Section 5 details planning procedures and a toss bombing calculation.

## STRAFING

With the sight in AIR-GROUND G/R/M, the gun-sight pipper provides a gyro-stabilized sighting reference for all firing angles and ranges. For the longer firing ranges, it is possible to use the inverted V which provides a convenient fixed sighting reference. The 30 mm cannon is a highly effective air-to-ground weapon against soft skinned targets since the Defa Type 6522 round is primarily designed for the air-to-air role. Armour piercing ammunition is not available in the RAAF and hence effectiveness against armoured targets is limited.

The mean gun bore line is depressed 26.5 mils below the FRL. Sighting angles normally result in the aircraft flight path being directed at a point within a few mils of the sighting reference (refer to Fig 4-5). Hence there is little or no pendulosity and the sight may be placed very near the desired aim point on roll-out. A recommended technique is to place the pipper on, or about 1-2 mils below, the aim point on roll-out to allow the pilot to follow the natural tendency to



move the pipper up towards the target. The aim point should be tracked for 1-2 seconds before firing. The aircraft should be trimmed for firing and the aim point held until cease-fire. Positively recover immediately after cease-fire. A minimum of 5 'g' should be maintained until the nose is at least 20° above the horizon to minimize the possibility of ricochet damage.

In crosswinds, the aim point can generally be held using bank alone. However, in very strong crosswind conditions a combination of drifting from an upwind aim point and then holding the aim point with bank just prior to and during firing is recommended to avoid excessive bank angles. Rudder corrections should be minimized to avoid excessive loads on the aircraft fin.

If the guns are fired when the aircraft is skidding, the trajectory is displaced in the direction of skid; this is called lateral trajectory shift error. At 400-500 KIAS, the trajectory shift error is about one fifth of the distance that the fixed sighting reference is moved, ie the impact position of the rounds will lag the final position one fifth of the total distance that the fixed sighting reference (inverted V) is moved.

In G/R/M, the sight has 1.5 to 2 hm sensitivity and the amount the pipper lags is dependent on the rate at which the aircraft is yawed. Observations indicate

the pipper generally lags the impact point of the rounds when momentary rudder corrections are made. Therefore when using the pipper as a sighting reference, yaw corrections should be made to move the pipper to a point just short of the desired aim point.



At normal airspeeds for gun firing, harsh use of rudder may result in excessive air loads on the fin.

#### **RADAR OPERATION**

The operation of the radar during air-to-ground weapon employment is discussed in DI(AF) AAP 7213.003-1.

#### **PHOTO RECONNAISSANCE MISSIONS**

The Fairchild KA56 panoramic camera is designed for tactical day reconnaissance at high speed and low level. It is an auto-cycling camera utilizing a 3 inch focal length, f4.5 lens. It achieves a lateral view of 180° (horizon to horizon) by rotating a double prism in front of the lens. Through an air data recording unit, the aircraft's position co-ordinates and heading are recorded on each frame at the



moment of exposure. The camera incorporates automatic exposure control (AEC) and forward motion compensation (FMC).

#### **Operation**

The aircraft's groundspeed ( $V_g$  kn) and height above terrain ( $H$  ft) must be manually set by the pilot. The ratio of groundspeed to height set by the pilot controls the camera's cycling rate within the range of one frame/sec to six frames/sec. The maximum cycling rate is achieved when the groundspeed to height ratio is 2.4, eg 600 KIAS/250 ft AGL and the minimum cycling rate when the groundspeed to height ratio is 0.38, eg 380 KIAS/1000 ft AGL. When the groundspeed to height ratio is between 0.38 and 2.4, successive frames have a fixed overlap of 56%. The overlap is greater when the groundspeed to height ratio is less than 0.38.

FMC is accomplished by displacing the lens in the longitudinal axis as the film is exposed. Lens movement is zero when the prism is at the horizon, increases as the prism moves to the point directly under the aircraft and decreases as the prism moves out to the opposite horizon. Proper FMC is maintained at  $V_g$  to  $H$  ratios from 0.1 to 2.4. To obtain good photographic results, the pilot is required to maintain accurate groundspeed and height and hold the wings level. Aircraft bank will improperly position the images for FMC. If the aircraft rolls, the camera, being fixed to the aircraft, will move and the lens movement will no longer compensate for the forward motion of the aircraft. The amount that rolling actually degrades the photographic result is a function of shutter speed and angle of bank.

To ensure correct operation of the camera :

- a. Ensure that the FRAMES EXPOSED counter is

set to zero.

- b. Switch on the Photo Reconnaissance Nose Cone (PRNC) air conditioning system by placing the radar switch to STND-BY or TX.
- c. Ground test the camera before flight to ensure that the film transport system is operating correctly. Correct operation is indicated only by the FRAMES EXPOSED counter operating. The FAIL light illuminates if the film breaks or no film remains.
- d. Exercise care in setting the manual ALT. ABOVE TERRAIN as it is easily mis-read.
- e. Set the CLOUD BELOW control to compensate for the higher than average exposure reading from cloud tops below the aircraft. The settings are 2/8, zero or 4/8. A setting of 2/8 increases the exposure by one f stop, ie doubles the exposure, while 4/8 increases the exposure by two f stops, ie quadruples the exposure.
- f. Maintain wings level during photography.
- g. Allow 15 seconds after PHI updating or station change for recycling of the DAR unit counters before the camera is used.
- h. The ground test (para c) will show any discrepancy or common error in the DAR. The counter is zeroed by the photographers. After landing, clear the camera with another 3-5 exposures.

#### **Operating Envelope**

The actual cycling rate may be obtained by applying the formula :

$$\text{Cycling rate} = \frac{5V_g}{2H}$$

## **WEAPON SUSPENSION SYSTEMS**

### **MATRA LAUNCHER**

The Matra Type 14 launcher (refer to Fig 1-10) is a streamlined apparatus designed for carriage and launch of the Matra R530K missile. The Matra R530KE missile may also be installed on the launcher. The launcher contains missile attachment and release fittings, cooling air transfer ducts and the electrical circuits for transferring power and information between the aircraft and the missile. The launcher is jettisonable.

#### **DESCRIPTION**

The Matra launcher has a metal finish and is fitted to the fuselage centreline of the aircraft by two positioning pins and an Alkan ball suspension mounting.

Two lateral braces stabilize the launcher on the aircraft. Electrically, the launcher is connected to the aircraft by two breakaway multi-pin plugs and three coaxial cables. The bottom of the launcher is fitted with two male missile rear attachment fittings and one female missile forward attachment point. The missile's forward attachment fitting is locked to the launcher by the launcher lock pin and remains on the launcher when the missile is fired.

#### **Front Section**

The front section of the launcher contains an air duct for supplying cooling air to the missile homing head.

## Matra Launcher Type 14

WEIGHT : 38.7 kg (85.3 lb)  
 LENGTH : 2.15 m (7.6 ft)  
 WIDTH : 127 mm (5 in)  
 DEPTH : 330 mm (13 in)

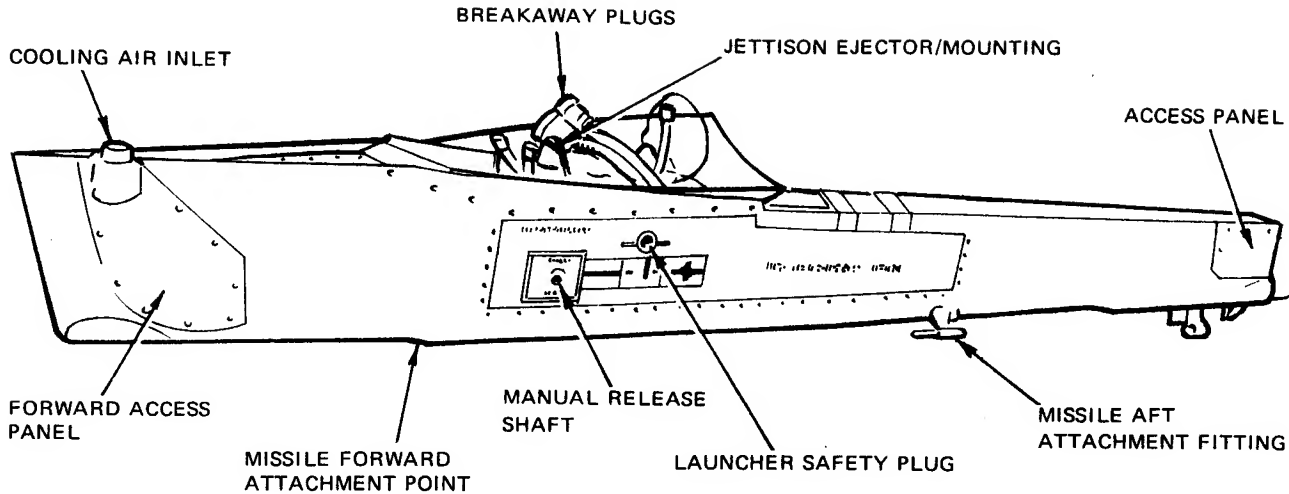


Figure 1-10

### Centre Section

The centre section of the launcher contains the electro-magnetic latch, the jettison ejector, the distribution box and electrical circuits, and the launcher safety plug. The electro-magnetic latch locks the missile mechanically to the launcher. The latch is unlocked when the firing signal is received.

#### Note

The electro-mechanical latch can be relocked manually on the ground or in the air by momentarily placing the MISS STND-BY switch to OFF.

The gas-operated jettison ejector is the hollow cylindrical Alkan ball type suspension unit. An ejector initiator is fitted into an extension from the hollow suspension unit. When the ejector initiator is fired, the piston in the ball suspension unit is moved to release the unit from the aircraft.

#### Note

Pressing the FUS jettison button on the jettison panel fires the ejector initiator which releases the launcher.

The distribution box and electrical circuits are connected to two breakaway multi-pin plugs at the rear of the launcher. The launcher safety plug, which is painted red with a black reference line across it, is labelled EJECTOR and is located on the left side of the launcher's centre section. When the plug is inserted in the socket so that the black line is vertical (GROUND), the jettison circuit is broken and the jettison initiator is grounded. Inserting the plug so that the black line is horizontal (FLIGHT) connects the jettison circuit to the initiator.

### Rear Section

The rear section is equipped with various electrical sockets and coaxial cables to electrically connect the launcher to the missile.

### TYPE 40 MATRA MISSILE LAUNCHER

The following is additional information to that contained in the AMD-BA Technical Handbook Mirage IIIO with R550 Missile Carriage System (Mods Z1112 and Z1113).

The Type 40 Matra missile launcher (refer to Fig 1-11) is attached to the outboard wing station through a non-jettisonable CES 3 pylon and an ADP4 adapter. This forms a complete carriage and launching system for the Matra R550 missile. The launcher which is in the form of a beam has the following dimensions:

- a. length: 270.5 cm,
- b. width: 96 cm,

- c. height: 14.7 cm, and
- d. mass:  $39 \pm 1$  kg.

The sub-assemblies which comprise the missile launcher (refer to Fig 1-12) are:

- a. a structure,
- b. a lock and ignition order assembly,
- c. a cooling assembly,
- d. a power supply unit,
- e. a missile preparation unit,
- f. a scan unit, and
- g. an interconnection assembly.

### Launcher Type 40 and Adapter ADP4 Installed on CES3 Pylon

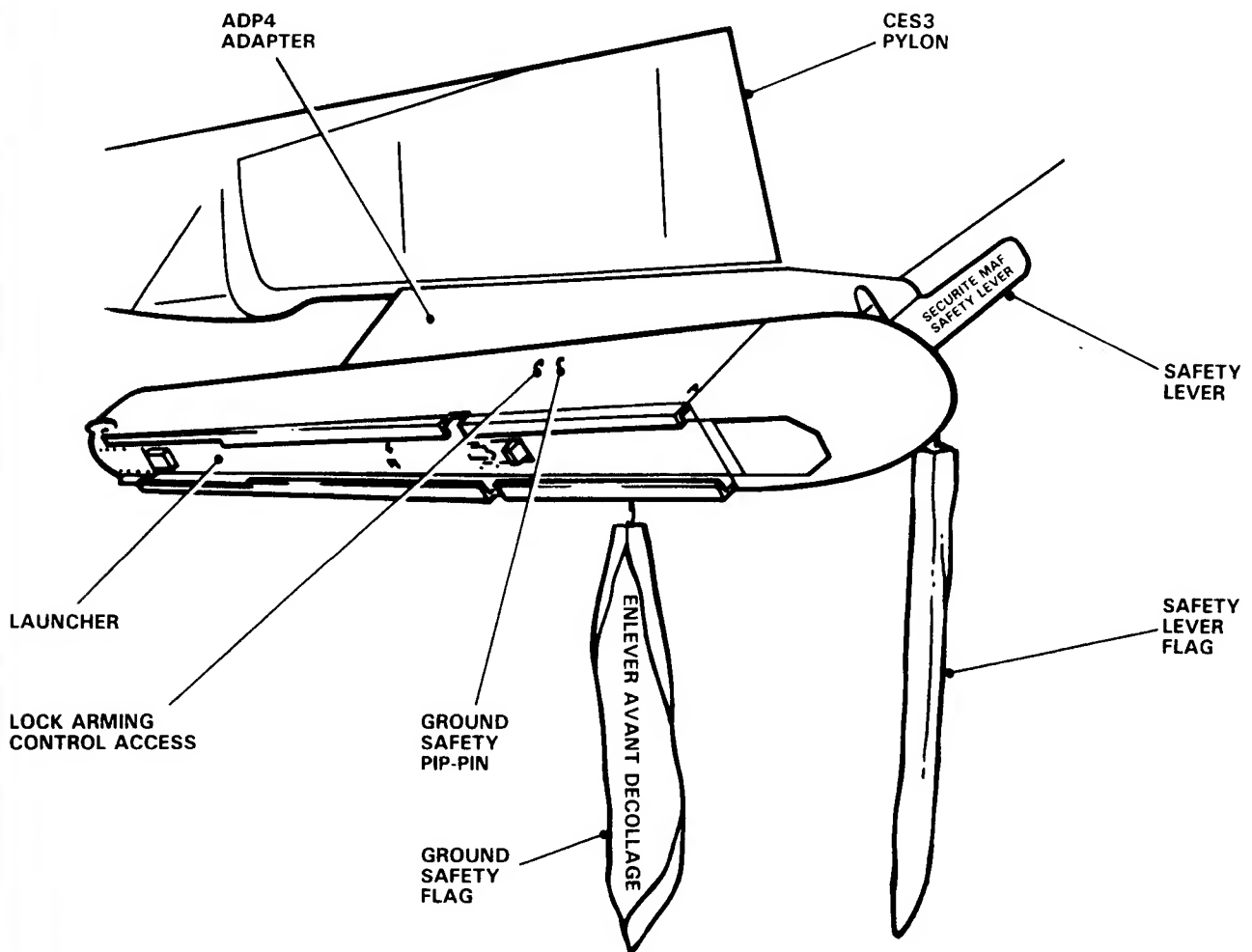


Figure 1-11

Matra Missile Launcher Type 40

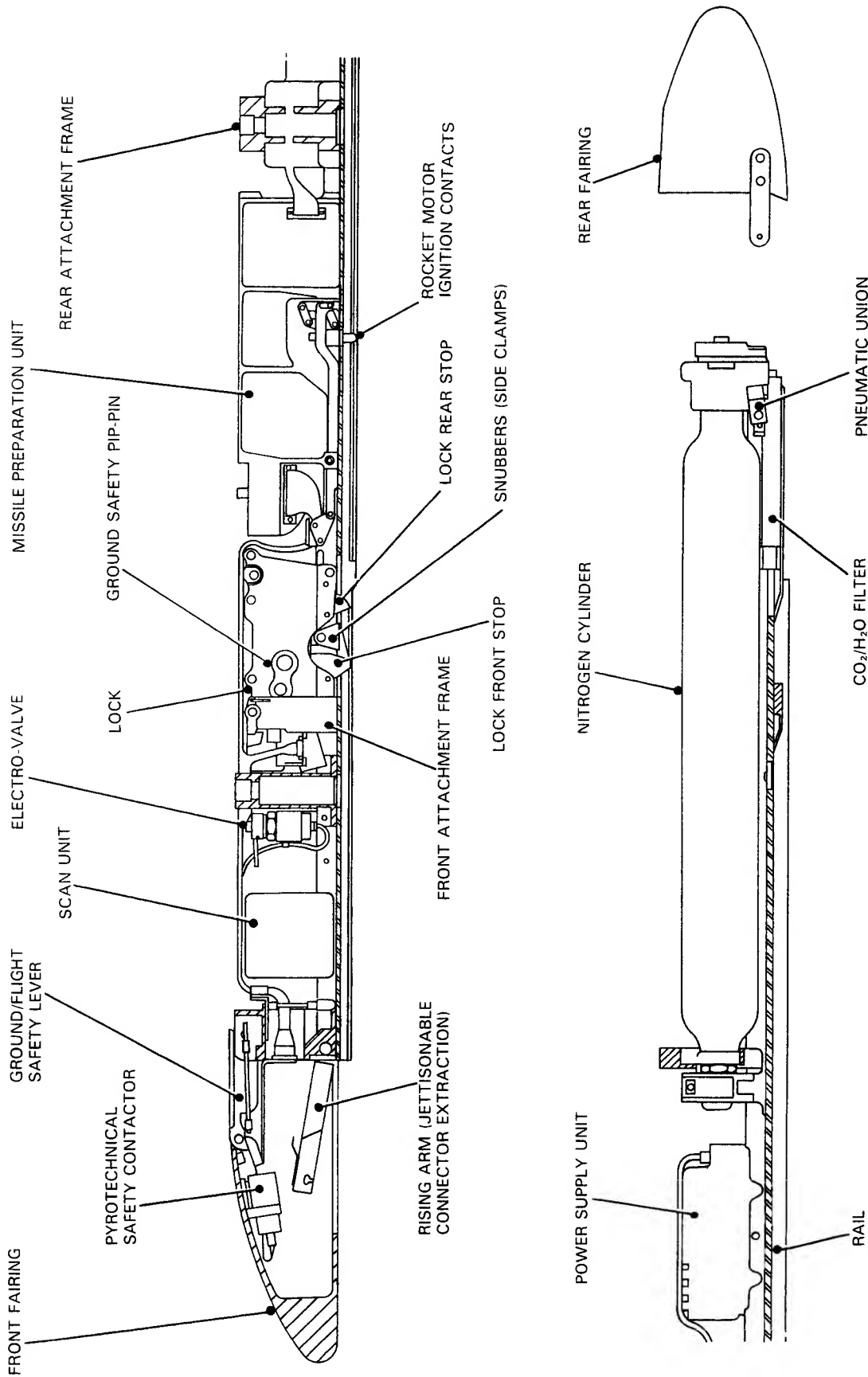


Figure 1-12

## PM-3 Bomb Beam

WEIGHT : 70.3 kg (155 lb)  
LENGTH : 3.65 m (12 ft)  
DEPTH : 250 mm (10 in)

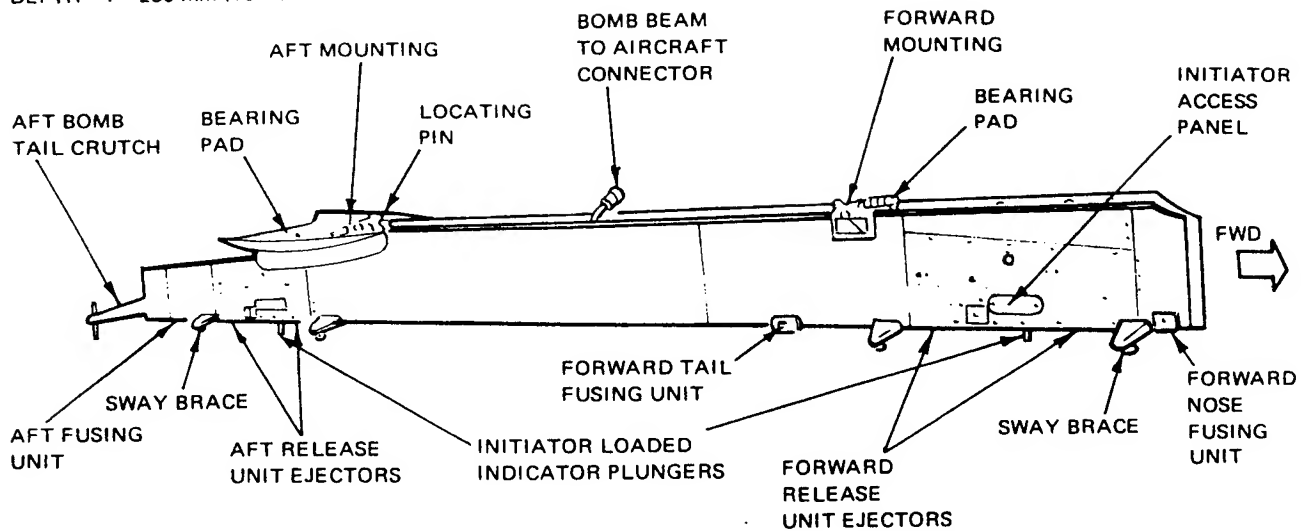


Figure 1-13

## ALKAN Type 257-2E Release Unit (PM-3)

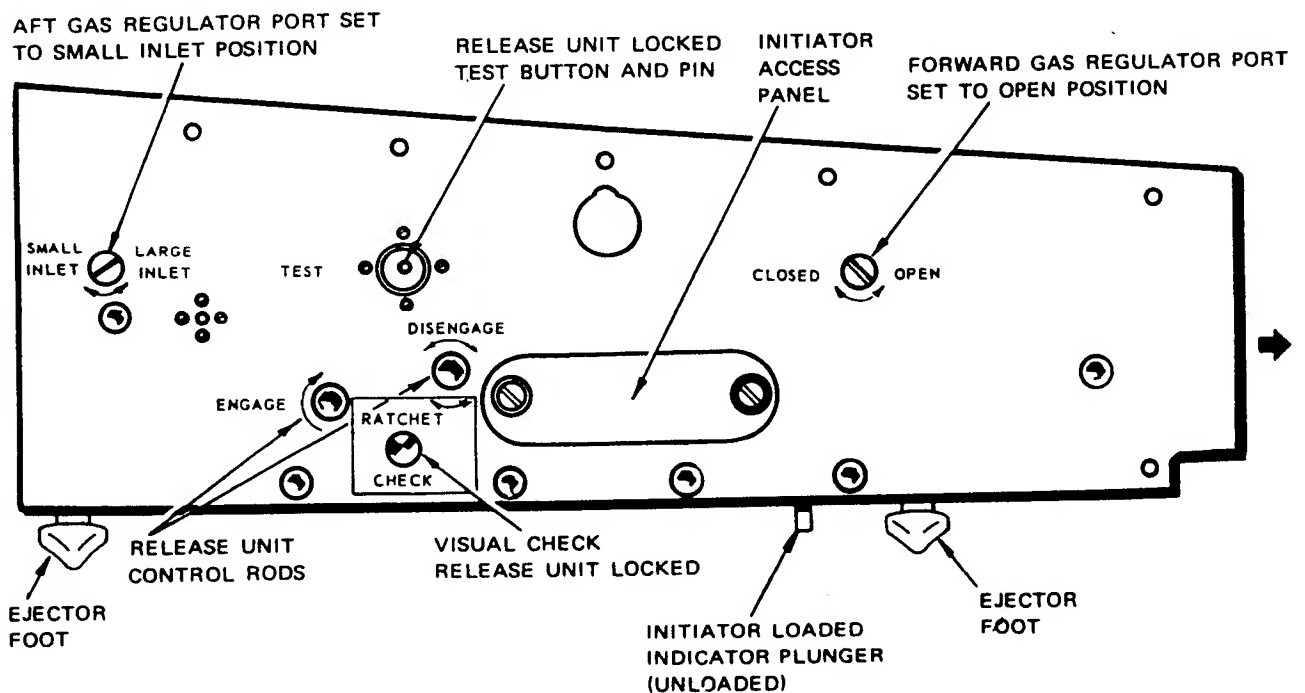


Figure 1-14

end of the stroke of the rear ejector.

#### Note

When one initiator is fired electrically, the other initiator detonates sympathetically. Both initiators must be installed to seal the pressure system and ensure that a release occurs.

Each release unit operates in conjunction with two solenoid operated fusing units. The fusing units are located on the front and rear of each Alkan release unit. The fusing units either retain or release the fusing loop of the arming wires, dependent upon the selection of the bomb fusing switches when the bomb is released. With NOSE selected, the front fusing unit retains the fusing loop. With TAIL selected, the rear fusing unit retains the fusing loop. With both switches selected to SAFE, neither fusing unit retains the fusing loop. After the bomb has been released, the selected solenoids retain the sheared ends of the fusing loops when all armament switches are selected OFF.

The PM-3 bomb beam is connected electrically to the aircraft via a multipin plug. The release circuitry housed in the centre section of the bomb beam operates in conjunction with the SINGLE/SALVO switch and the FUS jettison button on the jettison panel. The selection of SINGLE ensures that only one store is released with each press of the bomb release button, the rear being released first. The selection of SALVO releases both stores in a ripple at an interval of 0.3 second with a single press of the bomb button by means of a time delay relay on the front station. The bomb button must be held down for more than 0.3 second or until the second store has released. If the bomb button is not held for the required 0.3 second only the rear store will release. If release of the forward store is attempted subsequently with SALVO selected, the bomb button must be held for 0.3 second to operate the time delay relay and effect release.

When the FUS jettison button is pressed, the aircraft battery is connected to the emergency circuit and both stores are released safe, regardless of fusing selections, in a ripple at an interval of 0.3 second. The FUS jettison button must be held for 0.3 second or until both stores have released. The front store will release after 0.3 second regardless of rear station.

#### Note

- When releasing stores in SALVO, the bomb button must be held down until both stores are released.
- When releasing stores with either SINGLE or SALVO selected, the front store cannot be released if the rear store is not released.
- The FUS jettison button must be held for more than 0.3 second to ensure separation of both stores.

To release a bomb from the bomb beam, the pilot must select the bomb station selector to FUS, the BOMBS switch to ON, the ARM MASTER switch to ON and press the missile/bomb button.

#### CAUTION

If only one bomb is carried on the front station of the PM-3 bomb beam, the rear station of the PM-3 must be unlocked.

The PM-3 bomb beam can carry the SUU-20A/A bomb and rocket dispenser on the rear station. An electrical Cannon plug on the underside of the bomb beam (forward of the rear release unit) is activated when a transfer switch adapter plug is installed in a well on the bottom of the bomb beam. The well is also forward of the rear release unit, but immediately to the rear of the Cannon plug. This Cannon plug, through an electrical lead, supplies power to the dispenser. Bombs are released from the SUU-20A/A dispenser in the same manner as a normal bomb release, but the bomb station selector must be selected to FUS.

#### Note

- When using the SUU-20A/A, the SINGLE/SALVO switch and the bomb fusing switch have no effect.
- Stores may be released from the PM-3 with the bomb station selector on FUS with SINGLE selected or F+W with SALVO selected, but FUS must be selected to drop BDU-33 bombs from the SUU-20A/A.
- A micro switch in the left wheel well prevents bomb release from the PM-3 bomb beam when the undercarriage is extended.

### RPK10 TANK/BOMB CARRIER

The RPK10 tank/bomb carrier (refer to Fig 1-15) can carry 110 gal of fuel and up to four bombs, ie a maximum of eight bombs on two carriers. The bombs may be dropped singly or in multiples of two or four in a ripple release. The carriers are mounted on the inboard wing stations only. Approved configurations are shown in DI(AF) AAP 7213.003-1, Sect 5.

#### Note

- When ordering MK82 bombs, the type of carrier to be used must be specified to ensure correct fitment of the tail to the bomb body.
- Sidewinders or their pylons are not to be fitted when carrying bombs on RPK10 since the arming wires can foul when the bomb is released.



## RPK10 Tank Bomb Carrier



Figure 1-15

### DESCRIPTION

Each carrier is fitted with four electrically-actuated, gas-operated release units. Each release unit utilizes two initiators. The release units contain 355 mm (14 in) suspension hooks and twin piston ejectors. Two identical fusing units provide nose and tail fusing. On forward outboard release units, two attachment hardpoints are fitted to enable attachment of GBU-12 LGB lanyards. At the rear of each carrier is an intervalometer which controls the bomb releases interval for that carrier and the number of bombs released for each press of the missile/bomb button. A selector on each intervalometer provides the following possible combinations :

- up to two sticks of four bombs,
- up to four sticks of two bombs, and
- eight bombs dropped singly.

These combinations are provided by use of the SINGLE/SALVO switch selection by the pilot and the pre-set intervalometer setting.

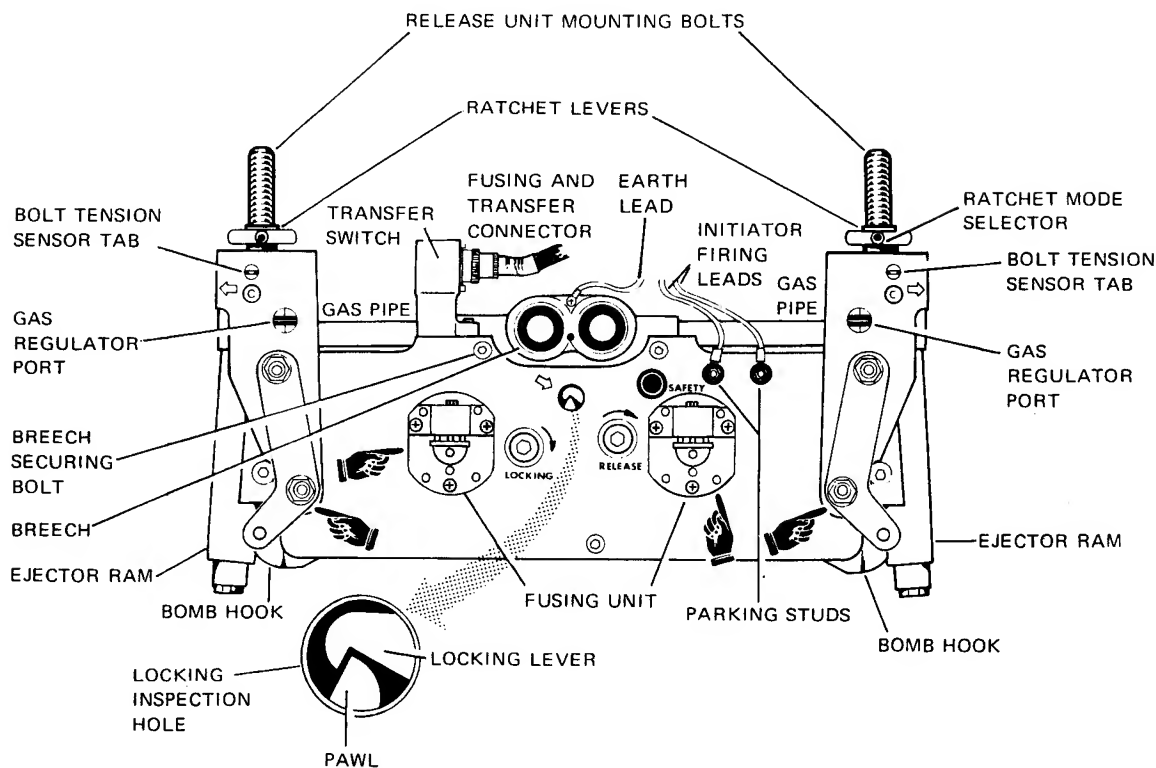
### Note

The eight bomb configuration is not cleared.  
The maximum permissible load is four bombs,  
two on the outboard stations of each RPK10.

### Release Unit Description and Operation

The ALKAN type 101 release unit fitted to the RPK10 is shown at Fig 1-16. The ratchet levers are used to crutch the bomb. The bolt sensor tension tabs protrude from the mounting bolts through the release unit. When the tabs can no longer be moved, the bomb is correctly crutched.

## ALKAN Type 101 Release Unit (RPK10)



**Figure 1-16**

The gas regulator port has two positions :

- when the thick red line is horizontal, the port is set on 7 mm, and
- when the thin red line is horizontal, the port is set on 1.2 mm.

On pre-flight, the locking inspection hole allows the pilot to check that the bomb hooks are closed and locked.

When the initiators fire, gas pressure is forced through the cartridge unit release piston which moves the pawl, allows the locking lever to operate and open the bomb hooks. At the same time, gas pressure passes through the gas pipe and regulator port (7 mm or 1.2 mm) and drives the ejector rams down onto the bomb. The bomb is ejected at an average velocity of 3.0 m/sec (9.8 ft/sec).

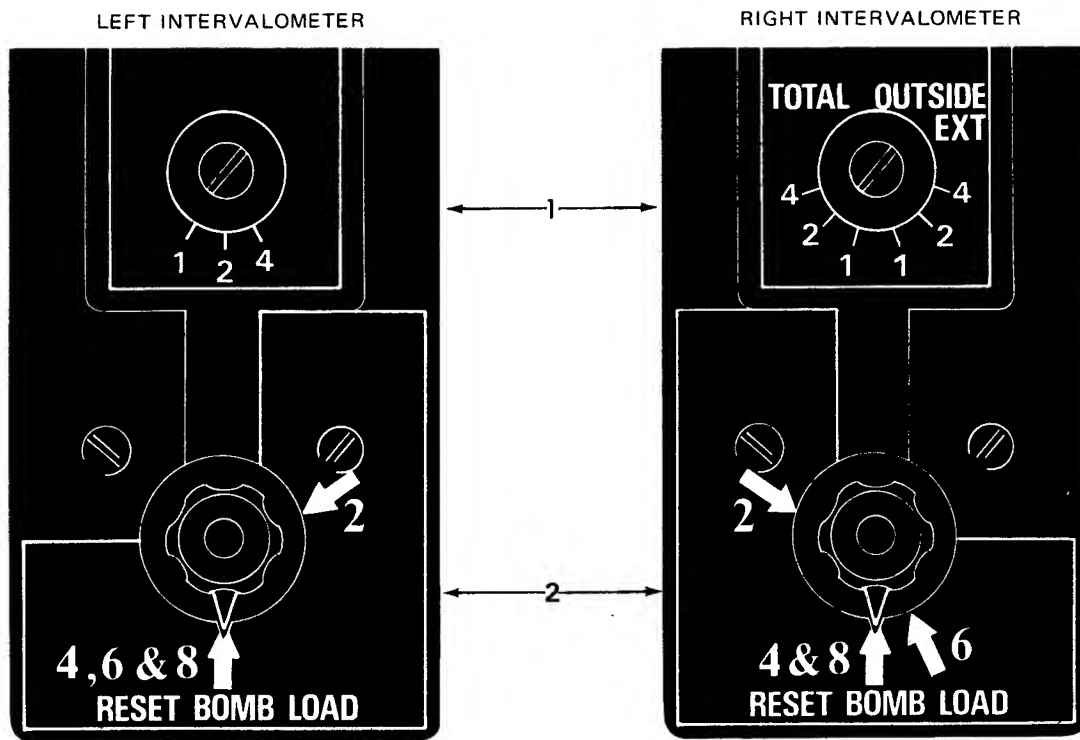
Release units must be fitted at all unloaded stations to ensure bomb release from the loaded stations. In order to complete the electrical circuitry all the unloaded stations must have :

- the transfer connector leads connected,
- the initiator leads connected to the parking studs, and
- the bomb hooks open.

### RPK10 INTERVALOMETERS

Each RPK10 functions as an independent unit acting on signals from the aircraft firing circuits. Phasing of release sequences between RPK10 carriers is accomplished by an intervalometer located in the rear of each unit inside a removable tail cone. The controls on each intervalometer (refer to Fig 1-17) must be pre-set to the desired release sequence before each mission.

## Intervalometers



- 1 BOMB MODE SELECTOR  
2 RESET BOMB LOAD SWITCH

Figure 1-17

### RIGHT RPK10 INTERVALOMETER

The intervalometer fitted to the right RPK10 controls the release sequences on the right RPK10. The release sequence on the right RPK10 is varied depending on the bomb load when less than eight bombs are carried (refer to Fig 1-18). The intervalometer controls are discussed in the following paragraphs.

#### Bomb Mode Selector

The bomb mode selector is a slotted shaft which can be manually set to the positions: TOTAL 1, 2 or 4 or the positions OUTSIDE EXT 1, 2 or 4. The positions 1, 2 or 4 refer to the number of bombs which will release for every press of the missile/bomb button, provided that the SINGLE/SALVO switch is in SINGLE. When four bombs are carried, with the selector set to OUTSIDE EXT 1, single bomb release is programmed, while with OUTSIDE EXT 2 set, release of a stick of two bombs is programmed.

The positions are also used as follows :

- TOTAL 1, 2 or 4.** This position provides the correct release sequence when a total of two bombs is carried on the RPK10. It must also be used when six or eight bombs are carried.

#### Note

- Carrying 6 or 8 bombs is not currently cleared.
- The TOTAL side of the bomb mode switch must be used when a total of two bombs is carried.
- OUTSIDE EXT 1, 2 or 4.** This position provides the correct release sequence when a total of 4 bombs is carried on the two RPK10 carriers (refer to Fig 1-19).

#### Note

- When a total of 4 bombs is carried, the OUTSIDE EXT side is used.
- When the SINGLE/SALVO switch is on SALVO the bomb mode selector is by-passed and all bombs are released in sequence.
- The missile/bomb button must be held down until the required number of bombs is released.

#### RESET BOMB LOAD Switch

The right intervalometer RESET BOMB LOAD switch is a rotating timer and has three starting

positions labelled 2, 4 & 8 and 6. The switch must be rotated anti-clockwise and selected to the appropriate position corresponding to the total bomb load on the RPK10 carriers. This positions the switch to the correct starting point for a partially loaded RPK10 allowing the sequence to by-pass unloaded stations, thus avoiding gaps in a ripple release. The timer steps at 0.15 second intervals but only every second step is used to produce a firing pulse. Thus a bomb leaves a particular RPK10 every 0.3 seconds.

#### LEFT RPK10 INTERVALOMETER

The left RPK10 intervalometer is similar to the right RPK10 intervalometer except that it does not have the TOTAL/OUTSIDE EXT function on the bomb mode selector, and the RESET BOMB LOAD switch has only two positions.

#### Bomb Mode Selector

The left RPK10 intervalometer bomb mode selector must be set to the corresponding position set on the right RPK10 intervalometer bomb mode selector, ie 1, 2 or 4. The function of the switch is identical to the corresponding switch on the right RPK10 intervalometer.

#### RESET BOMB LOAD Switch

The left RESET BOMB LOAD switch is a rotating timer and has two positions; 2 and 4, 6 & 8. The switch must be rotated anti-clockwise and must be set to the position corresponding to the total bomb load carried on both RPK10 carriers.

#### RIGHT AND LEFT INTERVALOMETER PHASING

During any release sequence both RESET BOMB LOAD switches step at 0.15 second intervals. However only every second step of each switch is used to release a bomb. This results in bombs releasing from individual carriers every 0.3 seconds. The phasing between intervalometers is such that the firing pulses alternate and a bomb leaves the aircraft every 0.15 seconds. In all cases the release sequence starts at the left RPK10 (refer to Fig 1-18).

#### WARNING

Asymmetric hang-ups can occur with resultant aircraft control problems. It is essential to check that the switches on both intervalometers are correctly set before flight.

#### SINGLE/SALVO SWITCH

The relationship between RPK10 intervalometer settings and the SINGLE/SALVO switch is as follows :

- a. **SINGLE/SALVO Switch at SINGLE.** Bombs are released according to the intervalometer bomb mode selector settings. Single or controlled stick release is possible.

- b. **SINGLE/SALVO Switch at SALVO.** The bomb mode selectors are by-passed and bombs are released at 0.15 second intervals until the load is exhausted.

#### RELEASE SEQUENCE

The bomb release sequence for all possible loads is shown in Fig 1-18. The sequence applicable to the various loads remains unchanged whether the bombs are released singly, in pairs or in a stick of four. The same release sequence, with 0.15 second intervals between bombs, is followed irrespective of the SINGLE/SALVO switch selection.

#### Note

- In the normal release sequence, the non-release of any of the rear bombs prevents release of the front bomb on the same side. The remaining bombs on the carrier release normally.
- With SALVO selected, a bomb releases every 0.15 seconds, simultaneous release of all bombs is not possible using the normal method of release.

#### OPERATION

The RPK10 tank/bomb carriers are selected by placing the bomb station selector to WINGS or F+W. The selection is used as follows :

- a. **WINGS.** The WINGS position must be used to achieve normal bomb release when bombs are carried on the RPK10 only.
- b. **F+W.** The F+W position only operates with the SINGLE/SALVO switch in SALVO and is used when bombs are carried on both the PM-3 and RPK10.

#### Note

With the bomb station selector on F+W and the SINGLE/SALVO switch on SINGLE, no bombs can be released.

Normal operating checks for bombing with RPK10 are contained in Section 2. The options available, with the required switch selections, for releasing currently cleared configurations of bomb loads from RPK10 tank/bomb carriers are shown in Figure 1-19.

#### Note

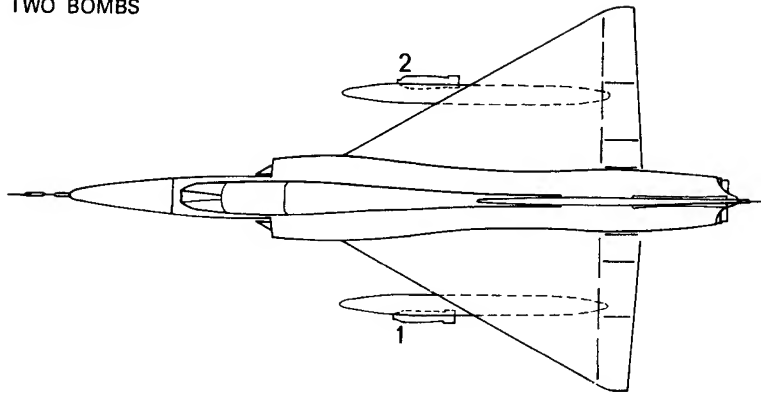
For multiple release or jettison using normal release switches, the missile/bomb button must be held pressed until release sequence is completed.

#### JETTISON FROM RPK10

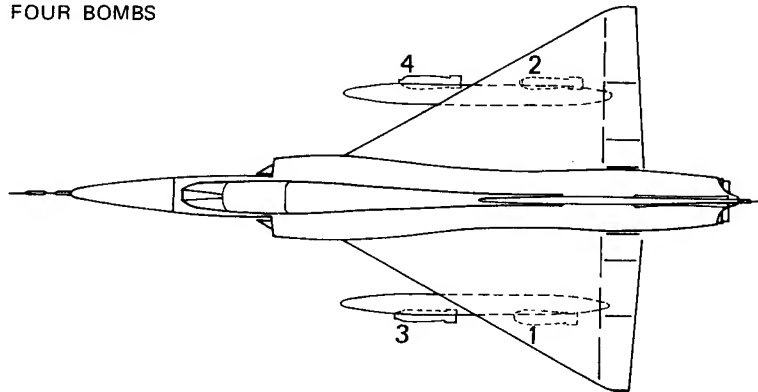
Bombs may be jettisoned safe from the RPK10 by pressing the WING jettison button. In this case all bombs release simultaneously. Bombs can also be released safe using normal armament switch selections and the missile/bomb button. Switch selections for safe release are contained in Sect 3.

## Dropping Sequence

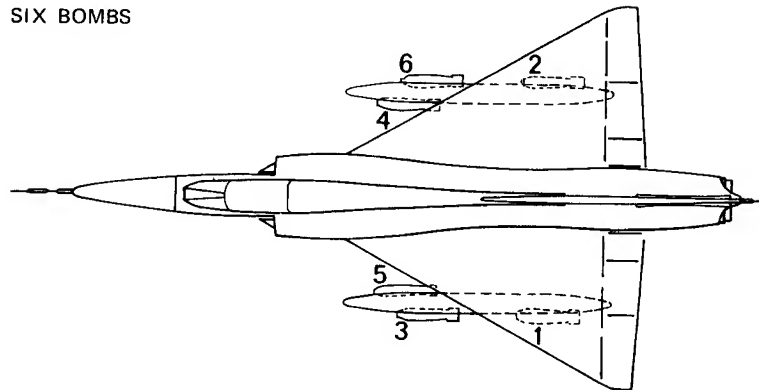
TWO BOMBS



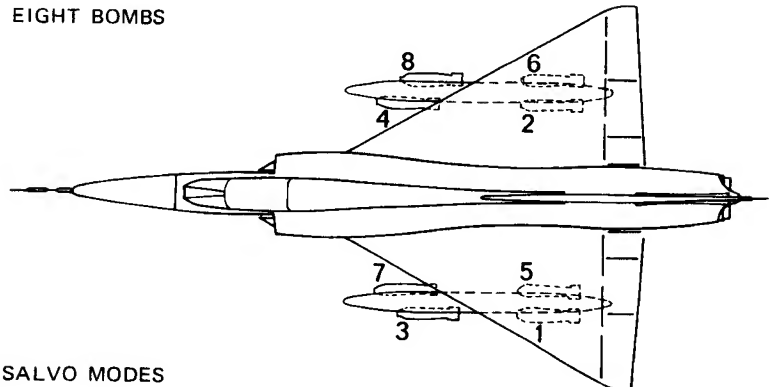
FOUR BOMBS



SIX BOMBS



EIGHT BOMBS



THE SEQUENCE IS IDENTICAL IN SINGLE OR SALVO MODES

**Figure 1-18**

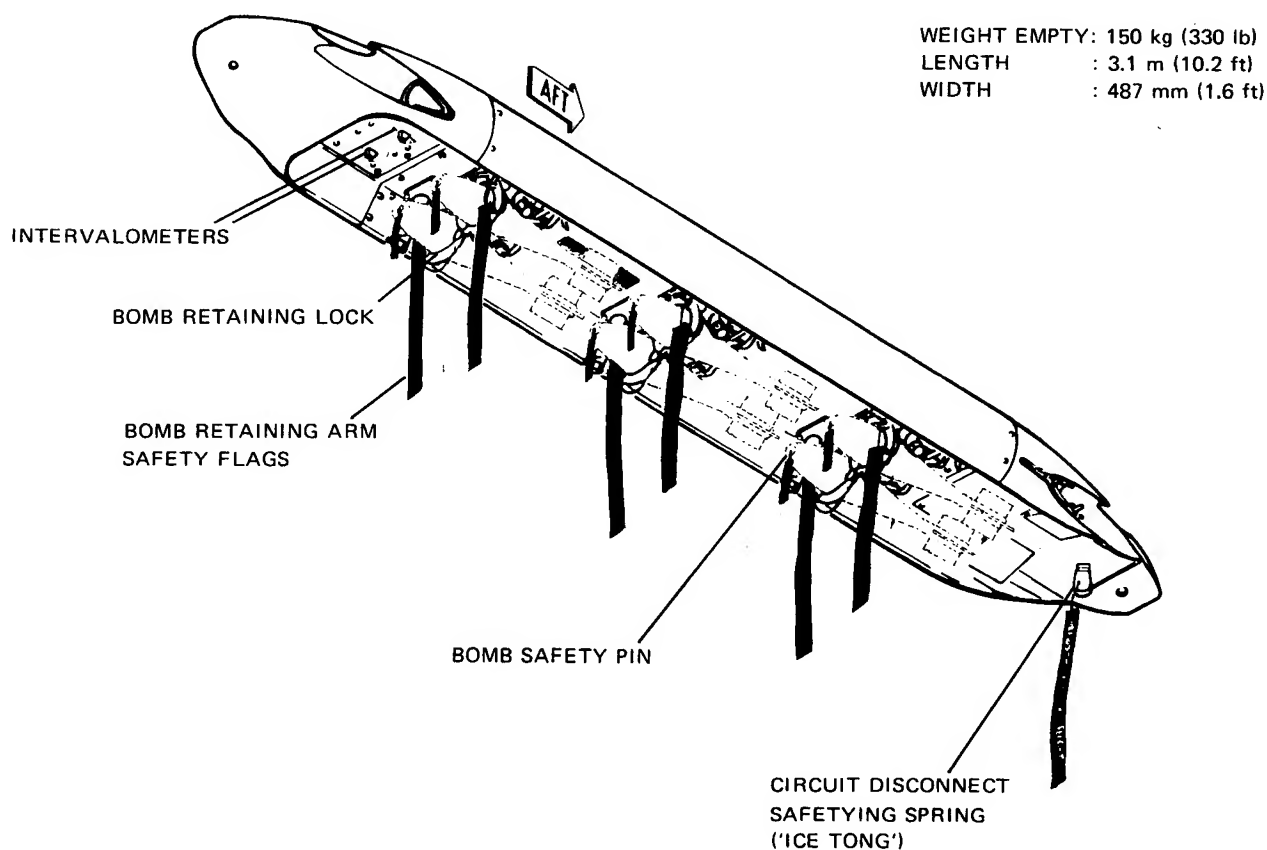
## Switch Selections — MK82 Bomb Release From RPK10

Total Bomb Load	Required Release Sequence	SINGLE/SALVO Switch	Bomb Mode Selector		Reset Bomb Load Switch	
			Left RPK10	Right RPK10	Left RPK10	Right RPK10
2	Single	SINGLE	1	TOTAL 1	2	2
2	Pair	SINGLE or SALVO	2	TOTAL 2	2	2
4	Single	SINGLE	1	OUTSIDE EXT 1	4, 6 & 8	4 & 8
4	Pairs	SINGLE	2	OUTSIDE EXT 2	4, 6 & 8	4 & 8
4	Stick of Four	SINGLE or SALVO	4	OUTSIDE EXT 4	4, 6 & 8	4 & 8

NOTE: For multiple release or jettison using normal release switches, the missile/bomb button must be held pressed until the release sequence is completed.

**Figure 1-19**

## SUU-20 A/A Dispenser



**Figure 1-20**

## SUU-20A/A BOMB AND ROCKET DISPENSER

The SUU-20A/A bomb and rocket dispenser (refer to Fig 1-20) is an externally mounted pod which has both rocket launching and practice bomb capabilities. Approved configurations are shown in DI(AF) AAP 7213.003-1, Sect 5.

### Note

The rocket launching capability is not used.

### DESCRIPTION

The SUU-20A/A is loaded on the rear station of the PM-3 bomb beam. The dispenser is electrically connected to the PM-3 bomb beam by an electrical lead fitted to the beam's practice bombing adapter socket (Cannon plug). The dispenser is designed to carry six practice bombs in a recessed open bay. Two intervalometers are installed forward of the bay to control the release sequences of bombs or rockets. Each bomb is held in an individual bomb ejector by two retaining arms and is securely levelled by two sway braces. Each ejector is fitted with a cartridge holder which is threaded into the ejector breech housing for ease of removal and installation. After installation, the cartridge holder is wrapped with a cable permanently attached to each ejector station (refer to Fig 1-21). The cable is fitted with a pin which is attached to the end of the cartridge holder to prevent the holder from backing out of the breech housing.

## Cartridge Holder Installed

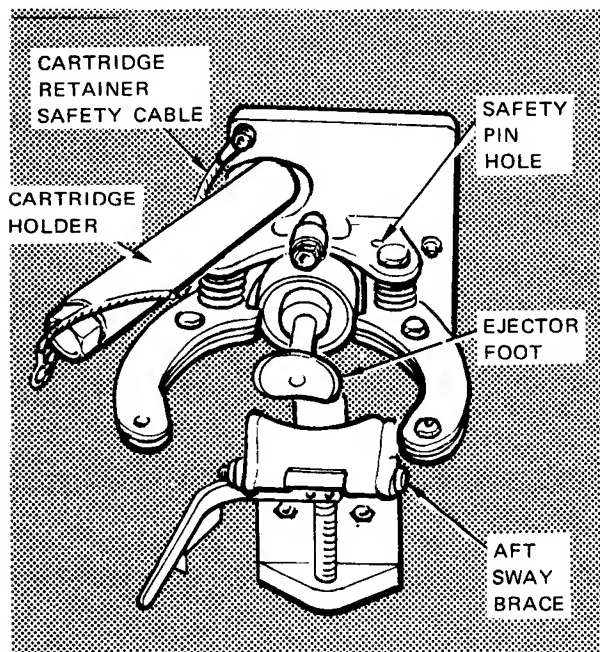


Figure 1-21

### OPERATION

The bomb ejector is a rod and piston assembly driven by gas pressure produced from an electrically-fired ejector cartridge. When the ejector cartridge is fired, gas pressure through the ejector assembly unlocks the retaining arms and forces the ejector foot against the practice bomb. The 11.3 kg (25 lb) practice bomb is ejected with a velocity of 6.4 m/sec (21 ft/sec).

A safety pin, installed in each ejector housing (refer to Fig 1-22), prevents the retaining arms and ejector from functioning. These pins are removed before flight.

## Ejector Gun Safety Pin Installed

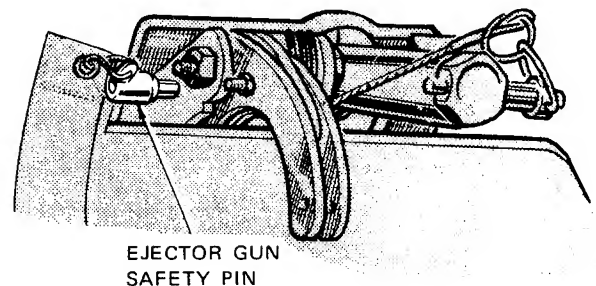


Figure 1-22

Two intervalometers are fitted in the SUU-20A/A forward of the six bomb stations (refer to Fig 1-23).

### Note

The rocket intervalometer is not used.

The bomb intervalometer controls all modes of dispenser operation and, before flight, must be selected to the ARM position preceding one of the following three modes of operation :

- SINGLE.** One bomb is dropped each time the bomb release button is pressed.
- RIPPLE.** All bombs are dropped in sequence when the bomb release button is pressed and held.

### Note

Because the interval between releases in the ripple mode is about 0.1 second, the bomb release button must be held for at least 0.5 seconds to ensure that all bombs are released.

- SALVO.** All bombs are dropped simultaneously when the bomb release button is pressed.

### Note

The SALVO mode is not used.

## SUU-20 A/A Dispenser Intervalometer

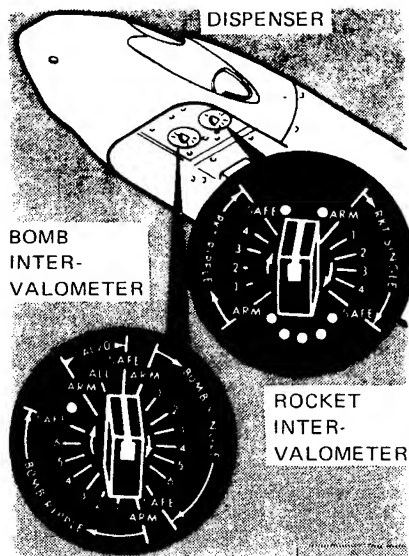


Figure 1-23

The release sequence in the SINGLE and RIPPLE mode is left forward, right rear, right forward, left rear, left centre and right centre. When the red-flagged dispenser safety spring is installed in the rear of the dispenser, electrical power is isolated from the intervalometers. The spring, known as the 'ice tong', is removed before flight.

### SAFETY FLAGS

The SUU-20A/A, when fully loaded before flight, has thirteen safety flags visible; one attached to each of the six bomb retaining arm safety pins, one attached to each bomb cartridge safety pin and one attached to the rear safety spring (ice tong). The bomb retaining arm safety pin locks the two retaining arms beneath the bomb, preventing inadvertent release. The bomb cartridge safety pin inserted in each BDU-33 holds the cartridge clear of the firing pin.

## NON-NUCLEAR WEAPONS

### MATRA R530K MISSILE

The Matra R530K is the primary intercept weapon for the Mirage IIIO. The Matra is a solid-propellant, rocket-powered, radar-guided, supersonic air-to-air missile. It is equipped with an expanding rod type warhead and is cooled by 9th stage compressor air fed from the aircraft through the launcher. The missile is white with a yellow band on the body around the warhead section.

The matra missile has a semi-active electromagnetic homing head, which makes use of Cyrano II radar energy reflected from the target. Capable of being fired in all sectors of attack and in all weather conditions, the missile follows a proportional navigation path towards the target until it is detonated by the proximity or contact fuse, or destroyed automatically. During the missile flight, the target must remain illuminated by the Cyrano II radar, except when homing on an active jamming target.

The missile is carried on the Matra type 14 launcher which is attached to the aircraft centreline station. The missile is fixed to the launcher by two female rear attachment mounts and a front attachment fitting. The missile's front fitting slides into a female fitting on the launcher and is secured by the launcher lock

pin. The missile front attachment fitting incorporates a copper shear pin which allows the front attachment fitting to remain in the launcher when the missile is fired. The missile is further restrained by a launcher electromagnetic latch which is unlocked at launch. Five electrical leads connect the missile to the launcher.

### Note

The FUS jettison button is used to jettison the launcher with the missile attached. The missile cannot be jettisoned separately.

### DESCRIPTION

The characteristics of the missile are :

- length—3.3 m (10.9 ft),
- wing span—1.13 m (3 ft 8½ in),
- weight—192 kg (423 lb),
- average velocity gain after launch—M0.9,
- active flight time—4.25 sec, and
- gyroscopic head limits— $\pm 40^\circ$ .

The missile (refer to Fig 1-24) consists of three major parts: the fore body, the centre body and the aft body.



## Matra R530K Missile

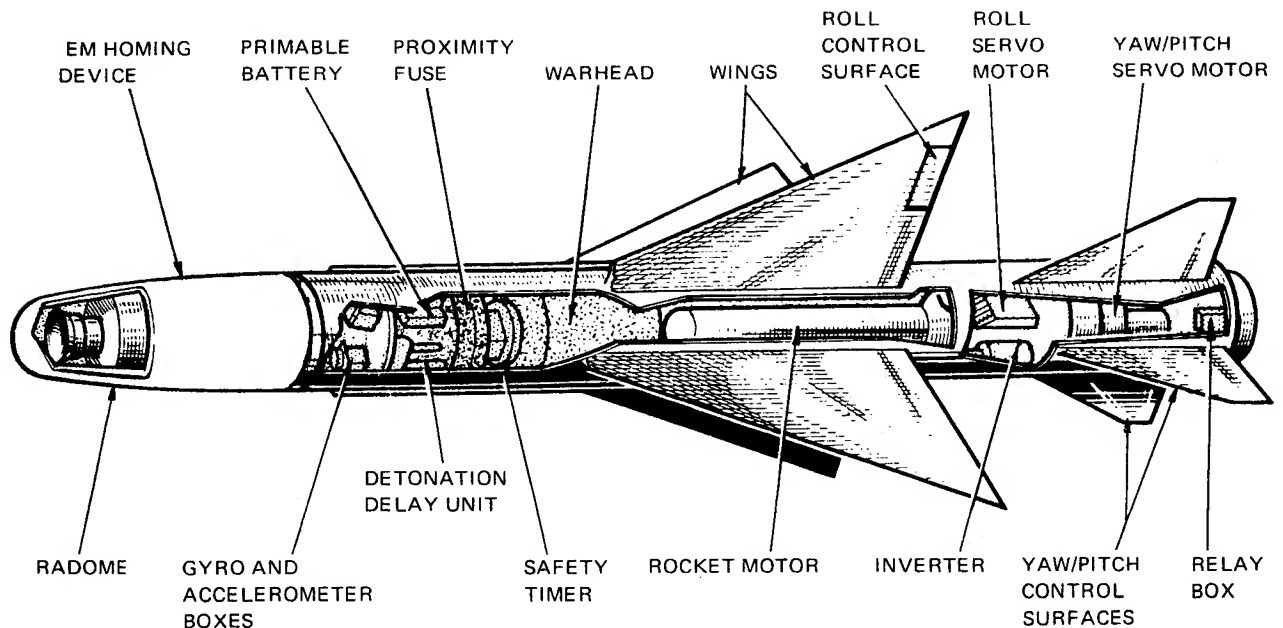


Figure 1-24

### Fore Body

The fore body contains the homing head and control sections. The homing head contains the gyroscopic head with a look angle of  $\pm 40^\circ$ , and an electronic chassis. The control section contains the autopilot, the primable battery, the detonation delay unit and the proximity fuse. The cable harness fairing and the transmitting and receiving antennae of the proximity fuse are attached externally to the control section. The cooling air for the electromagnetic head passes via a duct in the launcher through an inlet in the control section.

### Centre Body

The centre body contains the warhead with a safety plug and safety timer, portions of the rocket motor section and the wing assembly. The wing assembly incorporates four large triangular wings mounted at  $90^\circ$  to each other around the centre of the cylindrical body. These wings, one of which has a roll control surface at the trailing edge, ensure roll stability in flight with a roll rate of less than  $40^\circ/\text{sec}$ .

### WARNING

When the warhead SAFETY PLUG is installed flush with the side of the missile, the warhead is electrically connected to the firing circuit.

### Aft Body

The aft body contains the aft portion of the rocket motor including the external nozzle, the actuators and power supply section. The actuators and power supply section contain the roll actuator, a 400 Hz inverter and voltage regulator, the pitch and yaw actuators with four delta form control surfaces, the relay box and the launcher to missile connectors.

### Note

If the external nozzle of the rocket motor is not connected, the thrust obtained is not sufficient to launch the missile.

### MISSILE SYSTEM OPERATION BEFORE RADAR LOCK-ON.

#### Harmonization Box

Before radar lock-on, the harmonization box, which is located in the aircraft, aligns the missile frequency with the Cyrano frequency and also positions the homing head at the zero position (missile axis). These two operations are completed about 90 seconds after the MISS STND-BY switch is selected ON with the radar transmitting.

#### Missile Pre-heating

The proximity fuse and the missile battery must be pre-heated to ensure correct operation on firing. The proximity fuse requires about three minutes

heating with the MISS STND-BY switch selected ON to ensure correct functioning. The missile battery requires up to 15 minutes pre-heating if outside air temperature is about  $-30^{\circ}\text{C}$  and about 10 minutes pre-heating if the ambient temperature is about  $+20^{\circ}\text{C}$ . The battery is pre-heated whenever external DC power is applied to the aircraft regardless of the position of the MISS STAND-BY switch or the PRE-HEAT switch. However, when on internal aircraft power, the MISS STND-BY switch must be ON to ensure battery and proximity fuse pre-heating.

Ensure that :

- the missile battery has 15 minutes preheating prior to firing,
- the MISS STND-BY switch is selected ON before take-off and remains ON until after landing to avoid damage to the homing head, and
- the MISS STND-BY switch is selected ON at least three minutes before firing to ensure correct proximity fuse operation.

**Note**

Missile battery heating and the three minute MISS STND-BY switch ON period is a limiting factor during scramble operation.

**MISSILE SYSTEM OPERATION AFTER RADAR LOCK-ON**

**Harmonization Box**

After radar lock-on, the harmonization box :

- positions the missile antenna to coincide with that of the radar antenna in elevation and azimuth,
- alters the PRF of the Cyrano to position the target in the missile tracking gates, and
- produces the 800 Hz target acquisition lock-on tone or the interrupted 800 Hz masking tone as applicable.

Alignment of the homing head and the missile tracking gates to allow missile acquisition takes between one and six seconds and can only occur if the homing head is within  $40^{\circ}$  of the missile axis and not masked. The missile may not acquire the target within six seconds depending on target range and aspect, target reflecting area and radar/missile performance. If the target is small or the radar/missile sensitivity is low, it may be necessary to reduce the aircraft to target range before target acquisition by the missile is possible.

**Note**

The minimum time between radar lock-on and missile lock-on (missile tone) varies between one and six seconds. The missile homing head antenna must be within  $\pm 40^{\circ}$  limits, hence the pilot must ensure that the radar antenna is also within this limit.

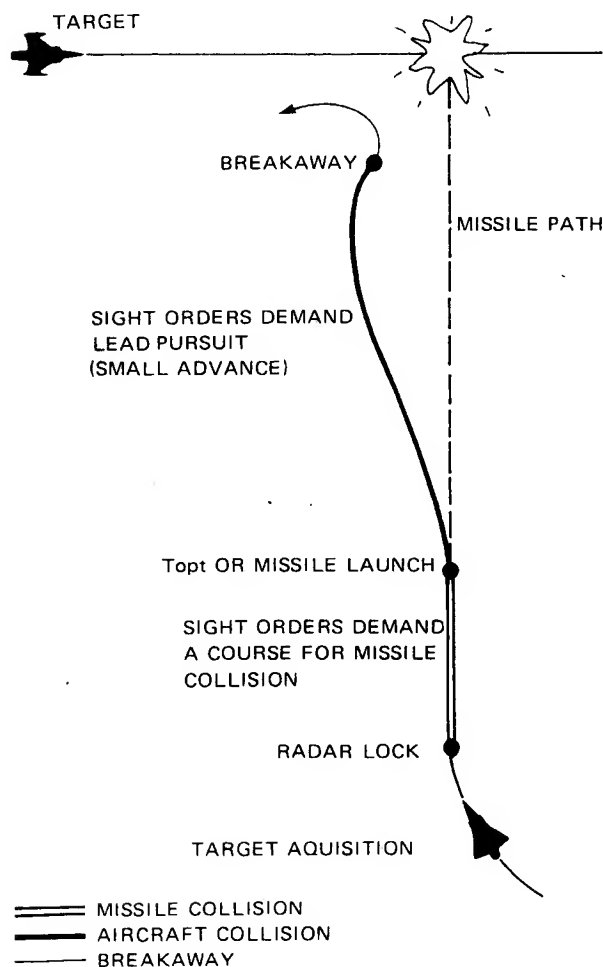
The missile masked tone is related to radar antenna

position and can be obtained with only the Matra pylon fitted. The masking tone is produced within the harmonization unit and is based on the angular position of the Cyrano antenna. The computed masked area is a zone bounded by  $\pm 1^{\circ}$  above the FRL at its lowest point and  $45^{\circ}$  each side of the FRL.

**Matra Computer**

The Matra computer is located in the aircraft. It continually computes and supplies to the missile the optimum proportional navigation constant (K) and the warhead detonation delay to suit the attack. At missile launch, K and the detonation delay are fixed. K is used by the missile guidance circuits to ensure flight orders give the optimum track to the target. The warhead detonation delay is adjusted for closing speed to ensure the best probability of kill.

**Fire Control Navigation — Matra**



**Figure 1-25**

### **Radar Navigation Computer**

The radar navigation computer uses  $V_r \sin \theta$  navigation to ensure the projected target position coincides with the ideal missile impact point at any given instant. Any deviation from the ideal ( $V_r \sin \theta = 0$ ), generates an error signal and the radar navigation computer modifies sight orders until the error is reduced to zero. This navigation results in a missile collision course (refer to Fig 1-25). When the missile is fired or at  $T_{opt}$ , whichever occurs first, the radar navigation computer changes sight orders to command a lead pursuit course with a small advance. When directed by the fire zone computer, the radar navigation computer issues breakaway sight orders.

### **Fire Zone Computer**

Entry into the missile fire zone is indicated by the green sequence light on the sight head which is controlled by the fire zone computer. This zone is a volume limited by :

- a. a minimum distance representing the 4 seconds minimum arming time of the missile;
- b. a maximum distance dependent on the launch aircraft speed, representing the 25 seconds flight preceeding missile self-destruction, or the time during which the missile velocity exceeds the aircraft velocity to ensure aircraft safety; and
- c. a lateral limit depending on the load factor the missile can accept if fired.

These three dimensional limits are complex and the firing zone is represented by its intersection with the plane containing the aircraft centreline and the target (refer to Fig 1-26). In this firing zone, an optimum impact point ( $I_o$ ) is defined in the aircraft longitudinal axis, together with a missile flight time ( $T_{opt}$ ) which is equal to :

- a. 10 sec when closing speed  $V_c$  is  $< 855$  knots (440 m/sec); and
- b. 6.8 sec when closing speed  $V_c$  is  $> 855$  knots (440 m/sec).

$I_o$  corresponds to the optimum firing distance ( $D_{opt}$ ) for a given closing speed. The fire zone computer generates a missile firing signal at  $T_{opt}$  and the missile is launched if the AUTO FIRE switch is ON.

After missile launch, the fire zone computer measures aircraft to missile range and compares it with aircraft to target range. The fire zone computer signals the radar navigation computer to issue breakaway orders when :

- a. it calculates that these ranges are equal, or
- b. the missile is not fired by the missile's computed minimum time of flight.

### **Fire Zone Considerations**

The missile should not be fired unless the missile tone is heard, the green light is on and sight orders are correctly cancelled (refer to TYPICAL INTERCEPT WITH MATRA). Also, the pilot must be thoroughly acquainted with the distance required

for firing to be successful. It is essential to remember that :

- a. missile lock-on (missile tone) is separated from radar lock-on by a minimum delay which varies between one and six seconds, and
- b. the warhead is activated only after four seconds of flight.

Consequently, where  $V_a$  is the aircraft speed in ft/sec,  $V_t$  the target speed is ft/sec and  $V_m$  the missile speed in ft/sec :

- a.  $V_m = V_a + 0.9$ ,
- b. the minimum desirable distance for radar lock-on in a head-on approach is  $(V_m + V_t) \times 10$  ft, and
- c. the minimum absolute firing distance is  $(V_m + V_t) \times 4$  ft.

Further information on missile envelopes is contained in appropriate classified publications.

### **Altitude Gain**

The altitude gain the Matra can achieve is about 15 000 ft. However, slant firing is not always possible because of radar lock-on, missile masking and aircraft handling difficulties.

### **Missile Lock-On**

The missile homing head must be locked onto the target echo before firing. Missile lock-on range depends on target aspect and total reflecting area, and radar/missile performance. Missile lock-on is automatic after homing head harmonization provided the antenna is within  $40^\circ$  of the missile axis and not masked, and is indicated by the continuous 800 Hz tone. The volume of this tone is adjusted by the MISS VOL rheostat located on the left console.

The missile lock-on tone will not be heard unless all appropriate missile switches are set for firing (refer to Sect 2).

### **FIRING**

Missile firing (refer to Fig 1-27) is initiated by operation of the missile/bomb button or the AUTO-FIRE circuit.

#### **Manual Firing**

When the missile/bomb button is pressed, the Matra firing sequence is initiated.

#### **Automatic Firing**

When the AUTO-FIRE switch is ON and the missile is locked-on, the missile fires automatically at  $T_{opt}$  as determined by the fire zone computer. Firing is initiated when the projected missile flight time is 6.8 seconds if the closing speed is greater than 855 knots or at 10 seconds if it is less than 855 knots.  $T_{opt}$  is therefore generally less for a frontal attack than for a stern attack.

#### **Note**

The missile may be fired manually before auto-fire occurs, if desired.

# Intercept with Matra

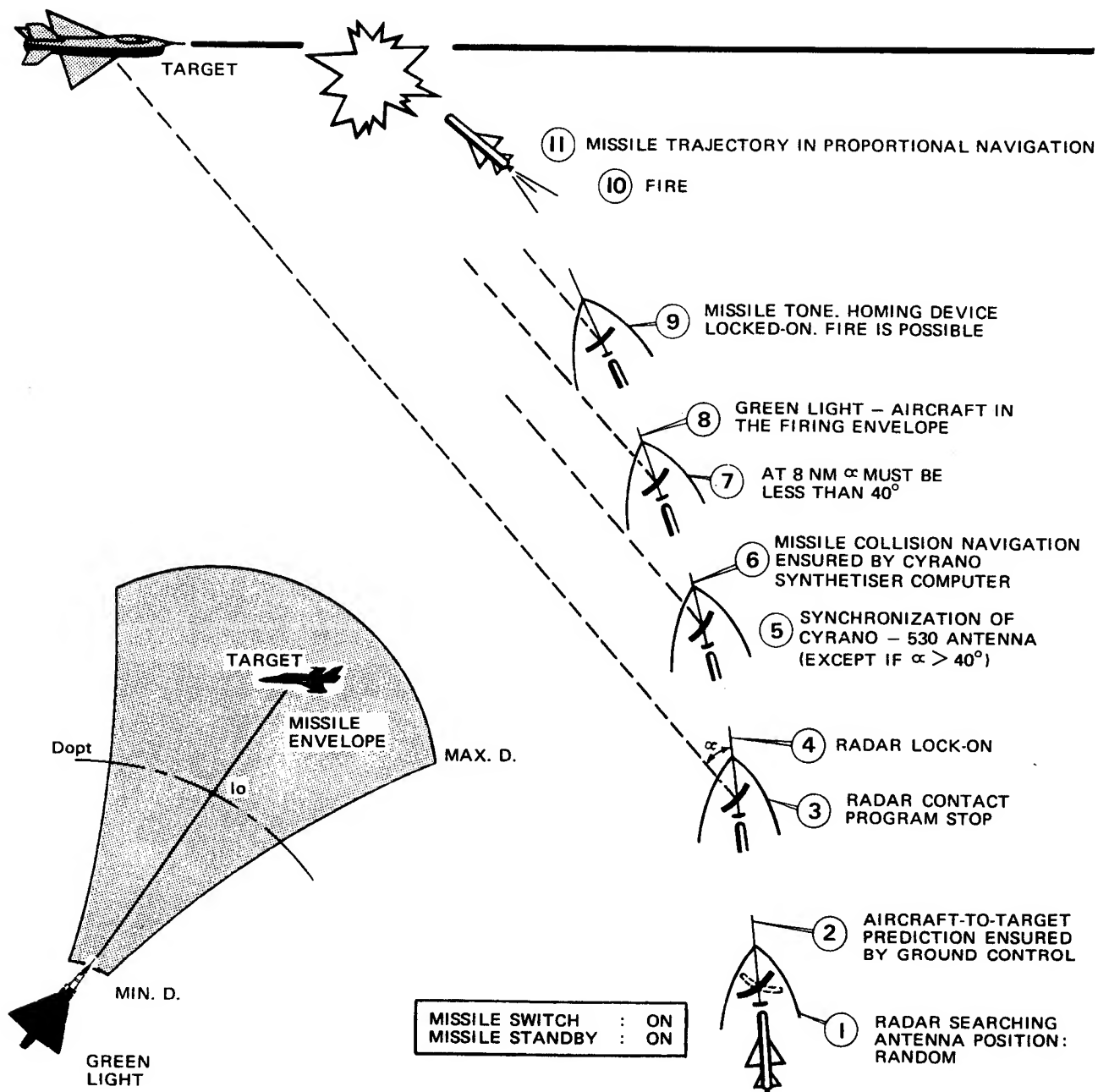


Figure 1-26

## Matra Firing

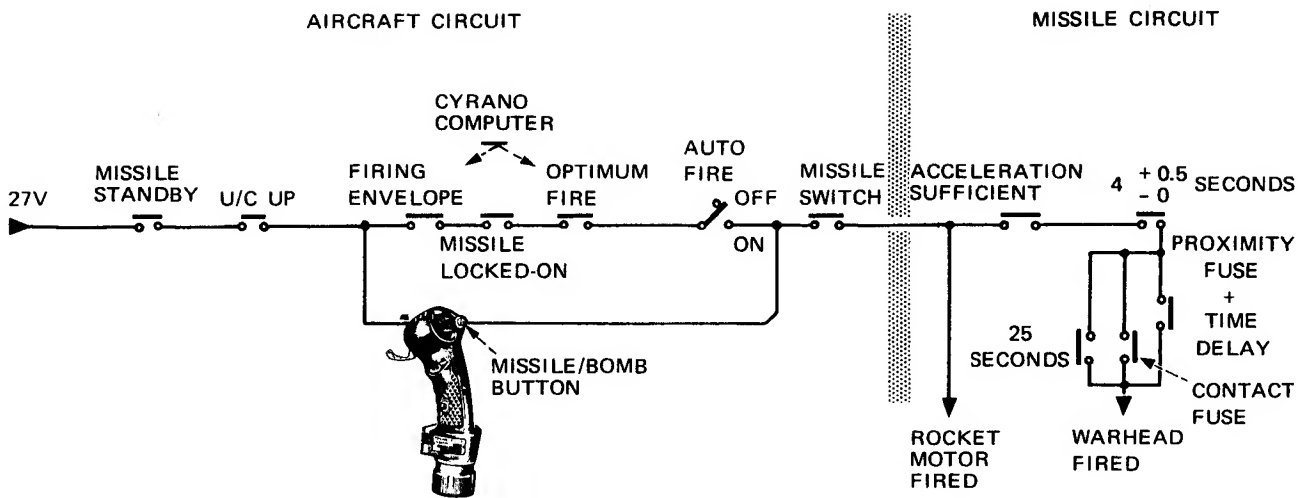


Figure 1-27

### Electrical Launch

When the firing signal is received :

- the 0.65 second timer is activated,
- missile battery priming is initiated and after about 0.5 seconds the battery should deliver full power,
- the navigation constant (K) and the detonation delay time are stored in the missile, and
- the electromagnetic lock in the launcher is opened.

#### Note

- At electrical launch the Cyrano PRF is frozen and the missile begins independent operations.
- If internal pressure in the rocket motor exceeds 15 000 kPa (2175 psi), two safety ports blow out to release the pressure and protect the aircraft.

### FREE FLIGHT PHASE

#### Mechanical Launch

The free flight phase commences at mechanical launch when the rocket motor ignites. Mechanical launch occurs 0.65 seconds after the firing signal is received. The initial acceleration of the missile breaks the copper shear pin in the front attachment fitting and disconnects the electrical leads at the rear of the missile. The rocket motor ignition lead is burnt away by the rocket motor exhaust.

### Flight Sequence

The sequence of events for the missile in flight is :

Time (sec)	Event
0	Mechanical launch; rocket motor ignites and fuse arming is commenced.
0.5	The control surfaces are unlocked but full control movement is unavailable. Allowable control deflection is progressively increased.
1.3	If 6.5 'g' acceleration is sensed, fuse arming continues.
2.5	Full control deflection is available. The booster phase of the rocket motor ceases, the cruise phase continues to burn.
4.0	Fuse arming is complete and the missile is fully operational.
7.5	Rocket motor burn out is complete.
25.0	If the proximity or contact fuse has not operated, the timer initiates detonation.

During missile flight, the homing head tracks the target in angle and range. The rate of movement of the homing head as it tracks the target is used to provide control orders, which direct the missile on its proportional navigation course to the target.

#### Note

After missile launch, the aircraft radar must continue to illuminate the target.

Commensurate with aircraft safety, the pilot must follow sight orders until breakaway orders are given.

#### Note

When the missile is launched, the missile gone signal causes the radar to scan erratically. Normal radar operation may be restored by momentarily selecting the MISS STND-BY switch OFF or by rotating the weapon system selector to another mode.

### WARHEAD AND FUSING OPERATION

#### Warhead

A continuous-rod, type 150 warhead is fitted to the Matra R530K missile. Two concentric layers of steel rods welded end to end and having a radius of 7.6 m (25 ft) are expanded outwards by a hexogen-tolite explosive. The warhead operation can be initiated by the proximity fuse, the contact fuse or the auto-destruct circuit.

#### Fuse Arming

If the missile achieves a minimum acceleration of 6.5 'g' at 1.3 sec after mechanical launch, fuse arming continues and both fuses will be operational after four seconds.

#### Proximity Fuse

The proximity fuse initiates warhead detonation when it senses a target in its zone of influence. At launch, the detonation delay unit introduces a time delay which depends on the closing speed and altitude. This delay ensures a maximum effect from warhead detonation.

#### Contact Fuse

A deceleration force of 200 'g' triggers the contact fuse.

#### Missile Self Destruct

If the missile miss distance is too great to operate the proximity fuse, the timer initiates detonation after about 25 seconds of flight.

### FIRING ENVELOPES

Missile firing envelopes are contained in classified Matra publications.

### JAMMING

The Matra homing head design incorporates some protection against noise jamming. However the missile has no protection against sophisticated jamming equipment.

#### Jamming Before Launch

When a target aircraft uses noise jamming before missile launch, the Cyrano radar locks on to the jammer signal for tracking. The antenna is directed towards the jammer and the homing head is passively locked onto the jammer by its special anti-jam circuits. Since the Cyrano radar can no longer supply range and closing speed information, there is no range tracking by either Cyrano or Matra. The Matra computer is no longer capable of calculating the proportional navigation co-efficient. Therefore, the

computer supplies a fixed value of K and a detonation delay corresponding to a rear attack which is the approach recommended against a jamming target. The Cyrano radar no longer supplies firing zone information. Therefore, to launch the missile, the pilot must be fully acquainted with minimum and maximum firing distances which are dependent upon altitude and closing speed. Aircraft to target distance must be determined from GCI information or, if possible, by the Cyrano radar. The average distances, in respect of altitude and approach position, which give the greatest probability of being within the firing zone are shown below.

Altitude	Type of approach		
	Head-on	Side or High Closing Speed	Rear or Low Closing Speed
20 000 to 30 000 ft	If not locked-on to a jammer, fire as soon as missile lock-on occurs but at not less than 3 NM If locked-on to a jammer, do not fire at more than 8 NM.	4 NM	2.5 NM
10 000 ft to 20 000 ft		3 NM	2 NM
0 to 10 000 ft		2 NM	1 NM

#### Jamming After Launch

When a target aircraft uses noise jamming after missile launch, the missile switches to passive homing. When passive reflectors such as chaff are used, the homing head should not transfer lock since the missile contains a range rate limiting circuit.

#### Accidental Jamming

In the case of accidental jamming, a device is provided to eliminate the effects of the homing head crossing the beam of another radar. Formation firing is thus possible provided the radars are not set on the same frequency.

### MATRA R550 OPERATIONAL MISSILE

The Matra R550 operational missile (refer to Fig 1-28) is an infra-red, passive homing, air-to-air, guided missile, mainly intended for clear weather (both day and night) close-range combat. It is cylindrical in shape with an ogival homing head and is fitted with a cruciform, canard wing assembly. The R550 missile is attached to the outboard wing station through a non-jettisonable pylon (CES3), an ADP4 adapter and a Type 40 Launcher. When installed on Mirage III aircraft, each R550 missile is offset outboard of the pylon axis by 58°. The IR homing head detector is cooled with gaseous nitrogen, stored at a pressure of 325 bars in the missile launcher. When fired, the R550 missile employs proportional navi-

## Matra R550 Operational Missile

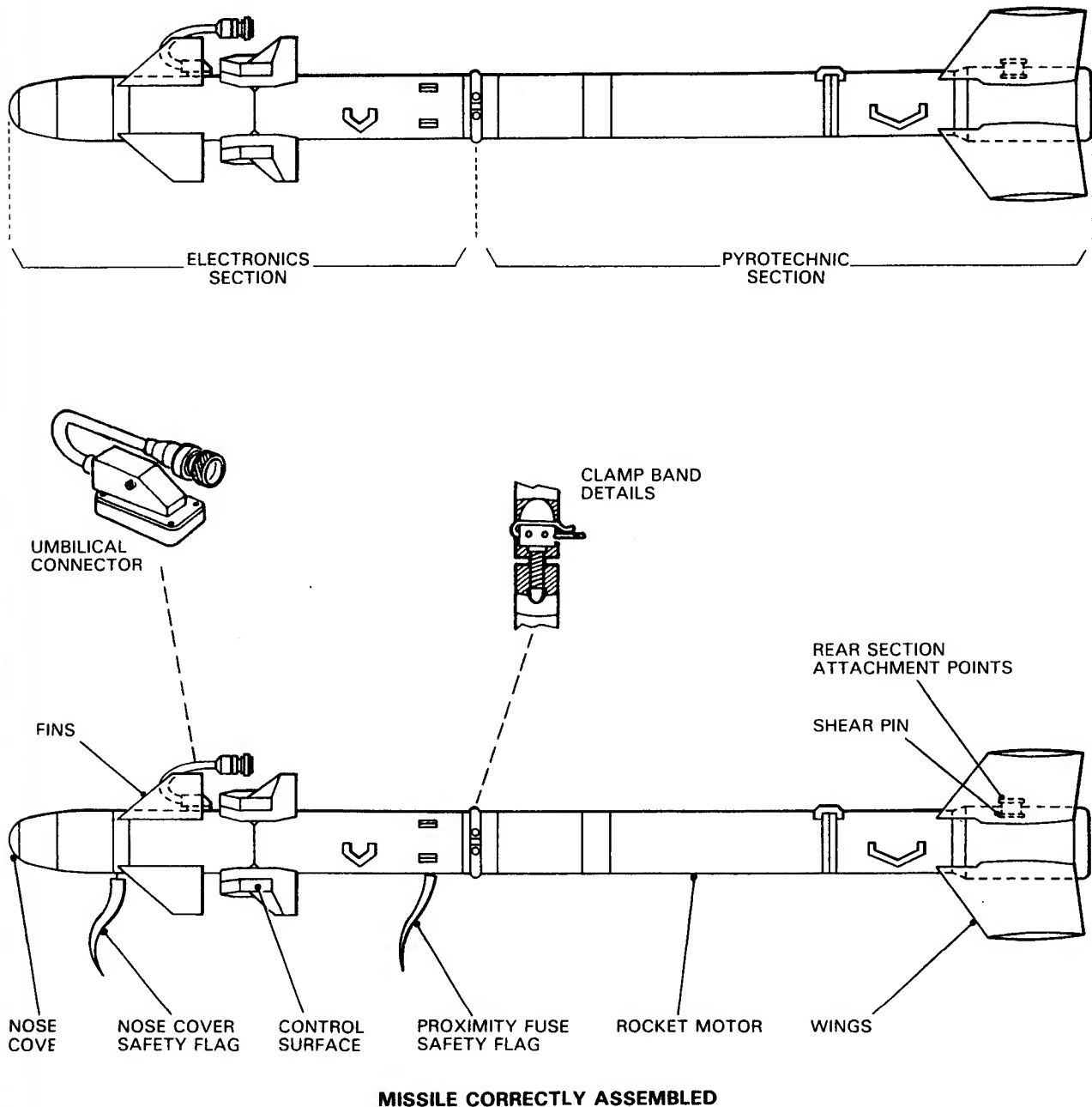


Figure 1-28

gation to guide itself to the target. The missile can be detonated on contact by an impact fuse, or by a near miss through the proximity fuse or can self-destruct after 25 to 35 seconds flight.

### DESCRIPTION

The physical characteristics of the missile are:

- length — 274.8 cm,
- overall body diameter — 16.4 cm,
- mass — 89.05 kg,
- wing span — 66 cm,
- canard fin span — 46 cm, and
- gyro head limits —  $\pm 30^\circ$ .

The operational characteristics of the missile are:

- Minimum range — approximately 500 m.
- Maximum range — approximately 10 km (5.4 NM).
- Flight duration — 25 to 35 seconds before self-destruction.

To facilitate test, handling and storage operations, the Matra R550 missile is divided into two sections which are joined by a clamp band. The two sections are the electronics section and the pyrotechnic section.

**ELECTRONICS SECTION**

The electronics section (refer to Fig 1-28A) consists of:

- a. an infra-red homing head,
- b. a gyroscope unit,
- c. an actuator unit fitted with four control surfaces,
- d. an auto pilot and voltage generator unit,
- e. a primeable battery,
- f. an infra-red proximity fuse,
- g. a safety and arming unit, and
- h. an umbilical cable containing electrical and nitrogen feed connections between the missile and the launcher.

**Homing Head**

The type 3601 homing head is an optical and electromechanical assembly. The homing head comprises the forward section of the missile extending back to the fins. It steers the R550 missile to the selected target by detecting the infra-red radiation from the jet engine tail-pipe and efflux. The homing head consists of:

- a. an optical and electromechanical assembly, including a moving mirror;
- b. a photo-electric detector and an optomechanical modulator which cyclically interrupts the radiation focused on the detector;
- c. an assembly of 'low-level' signal electronic circuits which determine, from the characteristics of the detected signal, the offset voltages required for servo control of the moving mirror;

- d. an assembly of 'high-level' signal electronic circuits, consisting of the torque-motor amplifier boards and the power supply circuits which produce the voltages required by the homing head; and
- e. a cooling system for sensitizing the infra-red detector.

The homing head is enclosed by a metallic envelope or 'skin'; the front end is closed by a spherical cap or IR dome of special glass which is transparent to the infra-red region used. During loading and handling operations, the homing head is protected by a removable cover to prevent damage to the glass dome.

**Note**

The homing head cover is removed immediately before flight.

**Gyroscope Unit**

The gyroscope unit contains a controlled precession gyroscope, the accelerometers for detecting missile 'g' loads and electronic components associated with each of these. Rotation of the missile-to-target vector is detected with respect to inertial axes by measuring the precession of the gyroscope whose rotor axis is aligned in the direction of the target. The principle of gyroscopic-head homing heads is used in a special manner, in that the moving target detection element (seeker unit) is not linked mechanically to the gyroscope, but is linked via a servo-loop. This arrangement allows high-speed search.

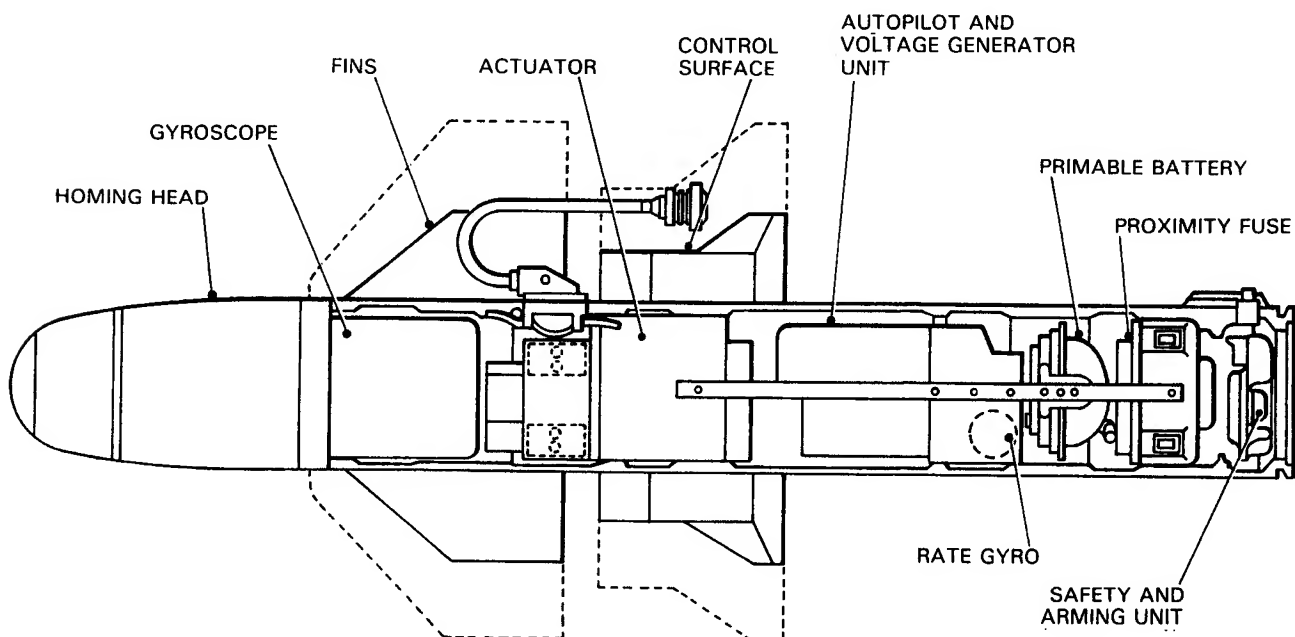
**Matra R550 Missile — Electronics Section**

Figure 1-28A



### **Actuator Assembly**

The actuator assembly consists of a motor and gearbox assembly and an interference suppression and control unit. The motor and gearbox assembly moves the control surfaces to the positions required to intercept the target, according to signal voltages produced by the voltage generator unit. The interference suppression and control unit energizes the motors to drive in the appropriate directions and suppresses the interference caused by these motors and their relays. The four control surfaces are light alloy castings protected by paint and fitted with stainless steel shafts.

### **Auto-pilot and Voltage Generator Unit**

The auto-pilot and voltage generator unit is located immediately behind the control surfaces and contains the circuits used for generating the steering orders fed to the actuator, the static voltage generator circuits and the roll rate gyro. Following target acquisition, when the elevation and bearing positions of the gyro rotor axis and the moving mirror axis are aligned, the auto-pilot feeds a 'coincidence' signal to the missile launcher, resulting in the launcher producing a 'gyro-aligned' signal. When the homing head receives the 'gyro-aligned' signal, the homing head circuits are switched to the 'guidance' mode. The elevation and bearing offset signals generated by these circuits are fed to the auto-pilot which produces the gyro precession orders for continually aligning the rotor axis in the direction of the target. The gyro torque-motor position voltages are compared with the corresponding voltages obtained on the homing head torque-motor potentiometer. The error voltages resulting from this comparison are used for driving the moving mirror to the direction of the target.

The AC and DC voltages for operating the various missile equipment is produced by the voltage generator from the primary power obtained from either the aircraft or the missile battery.

The roll rate gyro produces the angular velocity signals for controlling the missile in roll.

### **Primeable Battery**

The MT5 primeable battery is located immediately forward of the proximity fuse and provides a nominal 26.5 V to the voltage generator after missile launch. Prior to missile launch, the battery preheat circuits are energized automatically upon activation of the aircraft electrical power supply system, provided the 'Normal/Preheating' selector switch is at 'Normal'. Following operation of the launch button, a priming pulse fires the pyrotechnic perforator and gas generator releasing electrolyte to prime the battery.

### **Proximity Fuse**

The proximity fuse is a passive infra-red detector that sends a voltage pulse to the safety and arming system in any of the following cases:

- a. when missile/target presentation is such that the detected infra-red energy decreases rapidly (ie the missile is passing close to the target), or
- b. on target impact, or
- c. after a free flight time of 25 to 35 seconds.

The signal indicating target proximity is produced by detecting the infra-red energy radiated by the hot efflux of a jet tail pipe or by the almost black body constituted by the high-temperature tail pipe. Apart from having to satisfy the IR intensity levels and time requirements of the detectors and electronic circuits respectively, the proximity fuse is interconnected with the Safety and Arming Unit (SAU) to prevent inadvertent initiation in close proximity to the firing aircraft. For preloading operations, the four windows of the proximity fuse are covered by a protective belt which is removed prior to take-off. The missile contact fuse consists of two wires in the missile homing head which are crushed on target impact. An electrical circuit is made and an impulse is sent to the proximity fuse which initiates the warhead.

### **Safety and Arming Unit**

The SAU performs the following functions:

- a. In normal operation:
  - (1) transportation and handling safety during assembled missile storage,
  - (2) launch aircraft safety (launch and safe-distance conditions), and
  - (3) initiation of the warhead entry charge by the proximity fuse, impact fuse or self-destruct circuit.
- b. In defective operation (pyrotechnic train not aligned):
  - (1) Prevention of the initial charge in the explosive train from detonation.
- c. In defective operation (pyrotechnic train aligned):
  - (1) Non-operation of the proximity fuse.

Under normal conditions of missile firing, premature detonation is prevented by an accelerometer which detects missile 'g' loading, a clockwork timing circuit which disables the proximity fuse and a shutter which prevents alignment of the pyrotechnic train.

### **PYROTECHNIC SECTION**

The pyrotechnic section (refer to Fig 1-28B) consists of:

- a. a warhead,
- b. a single-stage rocket motor, and
- c. a rear assembly fitted with four wings.

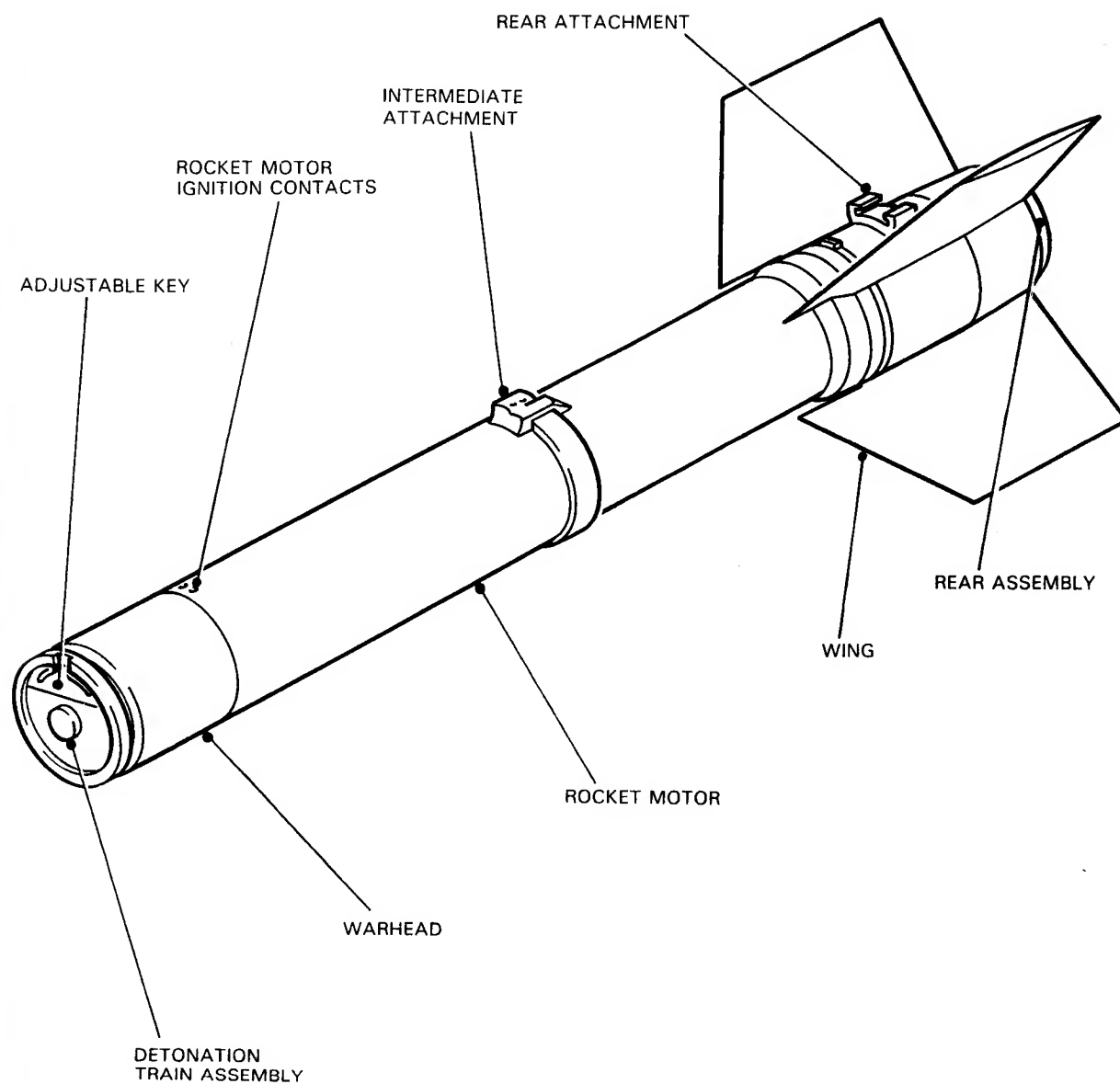
#### **Warhead**

The warhead, which forms the forward part of the pyrotechnic section, is located immediately behind the missile clamp band which joins the two halves of the missile together. The warhead is of the fragmentation type with central detonation. When initiated, the hexogene/tolite high explosive charge ruptures the warhead casing producing approximately 900 fragments having an average velocity in excess of 1550 m/s.

#### **Rocket Motor**

The single stage rocket motor is the propulsion system used to propel the R550 away from the aircraft and to maintain the missile during its free flight at a speed compatible with high manoeuvrability. The rocket

## Matra R550 Missile — Pyrotechnic Section



**Figure 1-288**

motor fires when the pilot operates the launch button provided the following conditions are satisfied:

- all aircraft undercarriage and weapon system interlocks have been removed,
- power is available from the missile launcher,
- the homing head is locked on,
- the gyro is aligned, and
- the ground/flight safety lever is retracted.

The emergency jettison function overrides all of the above functions except:

- power must be available, and
- the ground/flight safety lever must be retracted.

During emergency jettison, the missile is launched in the semi-inert state, since its rocket motor is ignited, but its battery is not primed. The rocket motor is ignited through two contacts located at the forward end of the motor which contact the launcher during normal flight. During pre-loading and maintenance operations, the ignition contacts are protected by a shunt.

**Structure and Wing Assembly**

The structure and wing assembly consists of moving or fixed sub-assemblies which play an important part in missile operation. The structure:

- provides mechanical cohesion between the sub-assemblies while protecting them,
- contributes to aerodynamic lift,
- improves aerodynamic performance by facilitating air flow by means of aerodynamic lines and continuity, and
- provides the missile with high manoeuvrability by withstanding the mechanical loads resulting from high 'g' manoeuvres.

The canard cruciform configuration of the missile reduces the response time to control surface deflections. In addition, this configuration makes it impossible for the missile to swing sideways as a result of flight-control system malfunction, since there is a maximum equilibrium incident angle corresponding to air-flow separation from the control surfaces and which the missile cannot exceed. This saturation effect constitutes a safety factor for the launch aircraft, enabling the control surfaces release time to be reduced which is a considerable advantage for short-range interception.

To obtain high manoeuvrability against evading targets, large area wings are provided. In addition, control surface efficiency is increased by the presence of fins which guide the air-flow onto the control surfaces.

The configuration adopted has the disadvantage of producing disturbances on the wings when the control surfaces are deflected, tending to oppose the ordered manoeuvre. In particular, if the wings are fixed, roll motions ordered by the differential deflection of the pitch control surfaces create an opposing couple, making it impossible to compensate for roll using a simple device. To overcome this difficulty, the four wings are mounted on a sleeve which can rotate freely about the longitudinal axis of the missile.

**MATRA R550 MISSILE SYSTEM OPERATION****Missile Preheating**

The missile primeable battery and gyro unit must be preheated to ensure correct operation on firing. Preheating occurs whenever the engine is started or external AC power is applied to the aircraft regardless of the position of the MISS STND-BY switch and providing the Normal/Pre-heat switch is selected to Normal.

The following preheat times are required:

OAT (°)	Time (minutes)
> 0	8
- 10	10
- 20	12
- 30	15

**Missile Preparation**

When the MISS STND-BY switch is selected ON, cooling of the homing heat IR cell commences, the rate gyro rotor, gyroscope and homing head modulator rotors run up, reaching operating speed in 34 seconds and operating temperature in 1 minute. If the missile is launched between 34 seconds and 1 minute after selecting MISS STND-BY ON, erroneous guidance occurs. If the time of launch is less than 34 seconds after selecting MISS STND-BY ON, the missile does not lock on and cannot be fired.

The MISS STND-BY switch should be selected ON at least 1 minute before missile launch to ensure complete cooling of the homing head. In order to conserve the missile nitrogen supply, the MISS STND-BY switch should only be selected ON for the operational portion of the mission.

**Note**

If a Matra R530 missile is carried, the MISS STND-BY switch must be left ON for the entire flight.

**Missile Scan**

The missile homing heads commence scanning when the MISS STND-BY switch is selected ON, and either S.W. or Dogfight weapon system mode is selected. These weapon mode selections must be made at least 2 seconds prior to missile launch.

During the scanning phase, the missile searches an area centred 39 mils above the top of the vertical arm of the fixed cross, or 1 mil below the AIR-AIR GUNS pipper. Only the homing head mobile mirror moves in accordance with elevation and bearing signals produced by the scan unit located in the missile launcher. Prior to target lock-on, the gyro axes are held parallel to the missile axes (zero alignment).

The pilot can select a narrow scan search pattern by depressing the Elec Cage/Boresight Button on the throttle to ensure that the missile locks on to the correct IR source if target discrimination is required. The narrow scan search pattern can be considered as missile boresight.



### **Target Lock-On**

When an IR target enters the field scanned by the missile, homing head lock-on occurs. The process of gyro alignment which occurs at homing head lock-on may take up to 0.7 second. The missile remains locked on to the target provided the mechanical limits of the homing head ( $\pm 30^\circ$ ) are not exceeded.

Missile lock-on is indicated to the pilot by the illumination of the appropriate missile lock-on light. While gyro alignment is taking place, this light flashes at 4 Hz. When alignment is complete, the light is illuminated continuously indicating that the missile is ready to fire.

An 800 Hz audio signal is also heard by the pilot at missile lock-on. The 800 Hz tone is chopped at 4 Hz during gyro alignment and steady on completion of alignment. The MISS VOLUME control rheostat adjusts the volume of this tone.

**[D]** The TACAN/S.W. switch must be selected to S.W. to monitor Matra R550 tone.

### **Missile Selection**

If the SINGLE/SALVO switch is selected to SINGLE, launch priority goes to the left-hand missile. If SALVO is selected, priority goes to the right-hand missile. At missile launch, if the selected missile is masked or if the gyro is not aligned, the transfer box automatically fires the other missile providing that alignment is complete. Automatic transfer also occurs if the first ignited missile fails to leave the aircraft. In this case, the firing button must be pressed again at least 3 seconds after the first launch attempt.

#### **Note**

If both missiles are locked on simultaneously, the audio signal heard by the pilot is obtained from the selected missile.

### **Switches**

If the correct switches are made to fire the Matra R550 missile, the purple sequence light is illuminated. To fire the missile, the pilot must select:

- a. MISS STND-BY switch ON;
- b. Weapons system selector to S.W. or depress the Dogfight button with the weapon system selector on;
- c. MISSILES switch ON;
- d. ARM MASTER switch ON; and
- e. Missile/Bomb button press.

### **Firing**

Pressing of the missile/bomb button fires the missile and activates a relay which closes the firing circuit for 3 seconds. If the first missile departs the launch aircraft, the second missile can be fired by releasing the missile button and then pressing it again at least 3 seconds after the first launch.

The pilot must confirm that he is within the missile firing envelope by reference to radar range and/or visual estimation of target range, angle off and closing speed before firing.

A delay of 0.7 second may occur between missile lock-on and gyro alignment. Rocket motor ignition occurs 0.3 second after the firing button is pressed. It is, therefore, recommended that the missile be fired as soon as the chopped 800 Hz tone is heard or the flashing lock-on light illuminates. The missile does not leave the launch aircraft until gyro alignment is complete.

#### **Note**

Matra R550 missiles can be fired SAFE by pressing the WING jettison button. The missile pylons, adapters and launchers remain under the wings. The missile impact and proximity fuses are safe and self-destruction does not take place.

At missile mechanical launch (0.3 second after the fire order) audio and visual lock-on indications for that missile stop. Three seconds after the initial firing order, audio and visual indications are received from the remaining missile if it is locked on.

If neither missile has locked on to the IR target when the missile button is pressed, missile launch does not take place.

### **Missile System Safety Features**

**Undercarriage Safety Relay.** The undercarriage safety relay is a microswitch operated by the left-hand undercarriage leg that prevents firing of the Matra R550 missiles while the undercarriage is down.

**Ground/Flight Safety Lever.** The ground/flight safety lever is a flap on each missile launcher that is retracted automatically when the aircraft exceeds 150 KIAS. It remains retracted for the rest of the flight.

### **Matra R550 Training Missile**

The training missile does not contain a primeable battery and cannot be fired. The missile does not have to be preheated before simulated firing.

#### **Note**

Simulated R550 Missile firing will initiate fuel dip.

**MATRA R550 MISSILE PERFORMANCE**

As a result of the varied and complex performance characteristics of the Matra R550 missile, the use of a rough 'rule of thumb' is not advisable. Pilots should become acquainted with the missile capabilities and firing envelopes contained in DI(AF) AAP 7213.003-1.

**GREEN SEQUENCE LIGHT**

The green sequence light provides information for the Sidewinder missile only and should, therefore, be disregarded for R550 operations.

**Note**

Complete information on missile capability and firing envelopes is contained in AAP 1143.

**30 mm DEFA GUNPACK TYPE 552**

Two 30 mm Defa guns are installed in a removable gunpack (refer to Fig 1-29) in the forward centre fuselage. When the gunpack is not installed, the bay is occupied by a gunbay tank.

**DESCRIPTION**

The characteristics of the gunpack are :

- complete gun pack weight plus 250 rounds—355 kg (783 lb),
- gun weight—81.6 kg (180 lb),
- gun length—1.88 m (6.2 ft),
- muzzle velocity—820 m/sec (2690 ft/sec), and
- rate of fire—1100-1300 rounds/minute.

The gunpack is a rigid assembly which contains :

- two guns and barrels,

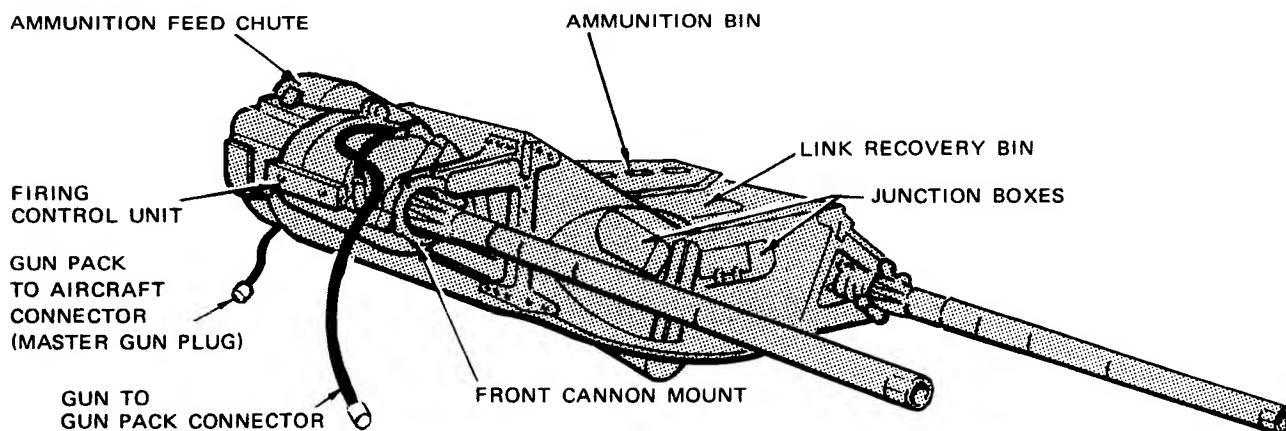
- two ammunition bins, each with a cover acting as a feed chute,
- two link recovery chutes,
- a link recovery bin,
- two gun mounts,
- three electrical Cannon plugs and two junction boxes, and
- an integral three cable winch for hoisting the gunpack into the aircraft.

The two forward Cannon plugs connect the guns to their respective junction boxes while the right rear Cannon plug connects the gunpack to the aircraft.

The gunpack is secured in the aircraft by four retaining bolts, two forward and two aft. No harmonization checks are required when the gunpack is installed or replaced in the aircraft. To install or remove the gunpack, the PM-3 bomb beam and the Matra missile but not the pylon must be first removed.

**OPERATION**

Each pack has a capacity of 250 rounds (125 per ammunition bin). However, links in current use limit this capacity to about 100 rounds per ammunition bin. The linked rounds are fed from the ammunition bins, through the feed chute and into the guns, where the rounds are stripped from the links. The links are recovered through the link recovery chutes to the link recovery box. Expended cases are ejected overboard through two ports in the aircraft fuselage aft of the gunpack. Electrical power for firing is supplied to the gunpack from the aircraft main DC bus via the master gun plug. Electrical power is distributed within the gun pack via two junction boxes, which supply the firing signal to the respective guns and supply an

**30 mm Defa Gunpack Type 552**

**Figure 1-29**

electrical firing signal to a pyrotechnic recocking charge if the normal firing sequence is delayed for more than 0.3 second.

**WARNING**

When a recocking cartridge is fired, an un-expended round could be ejected overboard.

**Note**

A safety microswitch in the left wheel well prevents the guns from firing when the undercarriage is extended.

Before the pilot's pre-flight inspection, the gunnery system is functionally checked, all electrical connections are made and the gunpack doors are fitted. The gunpack safety pin is inserted into the gunpack safety switch located on the underside of the gunpack to the right of the air purge scoop. The gun firing circuit is broken by the safety switch and cannot function until the safety pin is removed at the aircraft safety point by an armament tradesman. When the aircraft is airborne with the undercarriage retracted, the guns may be fired by selecting the GUNS switch on, the ARM MASTER switch ON and squeezing the trigger.

### 30 mm DEFA AMMUNITION

Two types of ammunition (refer to Fig 1-30) are available for use in the 30 mm Defa gun; Defa practice ammunition type 2102 and Defa combat ammunition type 6522. Both types use a similar cartridge case, primer, propellant, driving band and projectile casing. The projectiles, though similar in shape, differ in projectile filling and nose assembly.

#### DESCRIPTION

The characteristics of the ammunition are :

- length—200 mm (7.88 in),
- round weight 433 g (15.3 oz),
- projectile weight—230-235 g (8.1-8.3 oz), and
- average muzzle velocity—820 m/sec (2690 ft/sec).

The cartridge case is a steel cylinder closed at the end by a rimmed base. A hole in the centre of the base houses an electrically initiated primer. The propellant charge consists of 50 g of nitrocellulose multi-perforated grains. The projectile casing is a hollow casting around which is crimped the cartridge casing. The projectile case is fitted with a metal driving band which deforms to seal the projectile in the barrel grooving during firing. Two types of driving bands are used; one of a copper-zinc alloy and one of an iron compound. The belted ammunition is banded in a ratio to minimize coppering of the barrel. The forward end of the projectile casing is threaded for the fitment of a nose assembly.

## 30 mm Defa Ammunition

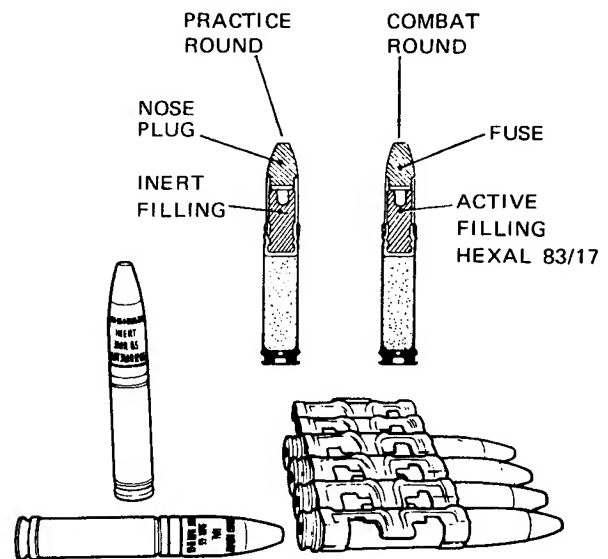


Figure 1-30

#### Practice Type 2102

The practice round is ball type ammunition, sage blue in colour. The projectile nose may be dip-coloured for ease of scoring. The projectile casing is filled with an inert compound and tipped with an inert nose plug.

#### Combat Type 6522

The combat round is high explosive type ammunition. It is a drab olive coloured projectile filled with Hexal 83/17 and fitted with a 1511 M Model 67 fuse.

#### OPERATION

The practice round is a simple ballistic projectile fired in the same manner as the combat round, but with no detonation. The combat round is fired when electrical energy from the Defa gun firing pin contacts the primer. The 1511 M Model 67 fuse is safe until the round leaves the barrel and acceleration ceases. The centrifugal force of the spinning round arms the fuse 4-5 m (13-17 ft) in front of the barrel. On impact with the target, the percussion cap of the fuse's delay detonator is activated and the round explodes after a short delay.

**Note**

If the round does not impact before the centrifugal force decays to a nominal figure, the round destroys itself.

### MK82 GENERAL PURPOSE BOMB

Four types of MK82 bomb bodies are available for use with the aircraft; the MK82 HE (high explosive) general purpose bomb, the MK82 HE/HES (high explosive/high explosive substitute) training weapon,

the low-charge practice bomb (LCPB) and the HES bomb. The HES bomb is an inert bomb used for trials and is not discussed further.

#### **MK82 Mod 2 HE BOMB**

The MK82 Mod 2 HE bomb is a 227 kg (500 lb) class, general purpose, high explosive weapon. It contains 83.5 kg (184 lb) of H-6 high explosive enclosed in a metal casing. The bomb fits both the PM-3 and RPK10 355 mm (14 in) double suspension. The bomb body is coloured olive drab with a 75 mm (3 in) yellow band at the nose end.

#### **MK82 HE/HES BOMB**

The MK82 HE/HES bomb is a practice weapon using the same case as the HE bomb. Most of the explosive is replaced; only 9 kg (20 lb) being retained. The letters COMP B/HES are stencilled in yellow on a 75 mm (3 in) yellow band at the nose end.

#### **MK82 LOW CHARGE PRACTICE BOMB**

The MK82 LCPB is an inert practice weapon which can be used for training without the attendant danger of high explosives. The bomb can be fitted with a M904E2 nose fuse or either a M905 or a FMU54/B tail fuse. In all cases, the spotting charge is located in the tail fuse well. The fuses and the spotting charge create two small danger areas; one immediately in front of the bomb and the other immediately behind the bomb.

#### **BOMB TAILS**

Two types of tail are available for either bomb :

- a. the MAU-93/B conical finned tail (a conventional cruciform fin), or
- b. the MK15 Mod 4 tail (Snakeye).

Either type of weapon with either tail can be fitted to the PM-3 bomb beam or the RPK10 tank/bomb carrier.

#### **MK82 BOMB WITH MAU-93/B TAIL**

The MK82 bomb fitted with the MAU-93/B tail (refer to Fig 1-31) is a nose and/or tail fused conventional bomb. Its characteristics are :

- a. weight—240.8 kg (530 lb),
- b. length—2.2 m (7.2 ft),
- c. diameter—275 mm (10.8 in), and
- d. fusing:
  - (1) nose—M904E2,
  - (2) tail—M905.

The complete bomb consists of :

- a. the bomb body;
- b. two suspension lugs;
- c. an MAU93/B tail;
- d. an M904E2 nose fuse;
- e. a nose adapter booster;
- f. an M905 tail fuse with arming vanes, a flexible drive assembly and a coupler drive assembly;
- g. a tail adapter booster; and

- h. the arming control system components (wires, loops, clips and brackets).

#### **Note**

A solid, streamlined nose plug may be fitted in place of the nose fuse.

#### **MK82 BOMB WITH MK15 MOD 4 TAIL (SNAKEYE)**

When fitted with the MK15 Mod 4 tail (Snakeye), the MK82 bomb is a tail fused, high drag (retarded) store. Its characteristics are :

- a. weight—255 kg (560 lb),
- b. length—2.28 m (7.5 ft),
- c. diameter—373 mm (14.7 in), and
- d. fusing—FMU-54/B tail fuse.

The complete bomb consists of :

- a. the bomb body,
- b. two suspension lugs,
- c. a MK15 Mod 4 tail,
- d. an FMU-54/B tail fuse,
- e. the arming control system components (wires, loops, clips and brackets), and
- f. a nose plug.

#### **Note**

A nose plug is fitted for peacetime operations. During combat operations a nose fuse may be fitted.

The approved configurations are contained in DI(AF) AAP 7213.003-1, Sect 5.

### **MECHANICAL ARMING CONTROL SYSTEMS**

#### **MK82 Bomb with MAU-93/B Tail**

The MK82, with the MAU-93/B tail, with M904E2 and M905 fuses, is mechanically armed by the use of lanyards as arming wires.

The M904E2 nose fuse is armed by removing a flagged safety wire which prevents arming vane rotation (refer to Fig 1-32).

During an armed release, the forces generated by the bomb separation overcome the friction of the two safety clips and the lanyard is withdrawn from the path of the arming vane. Continued separation brings the ferrule/stop against the bracket causing the arming loop shear link to part. The lanyard falls with the bomb; only the arming loop is retained in the arming solenoid (refer to Fig 1-33).

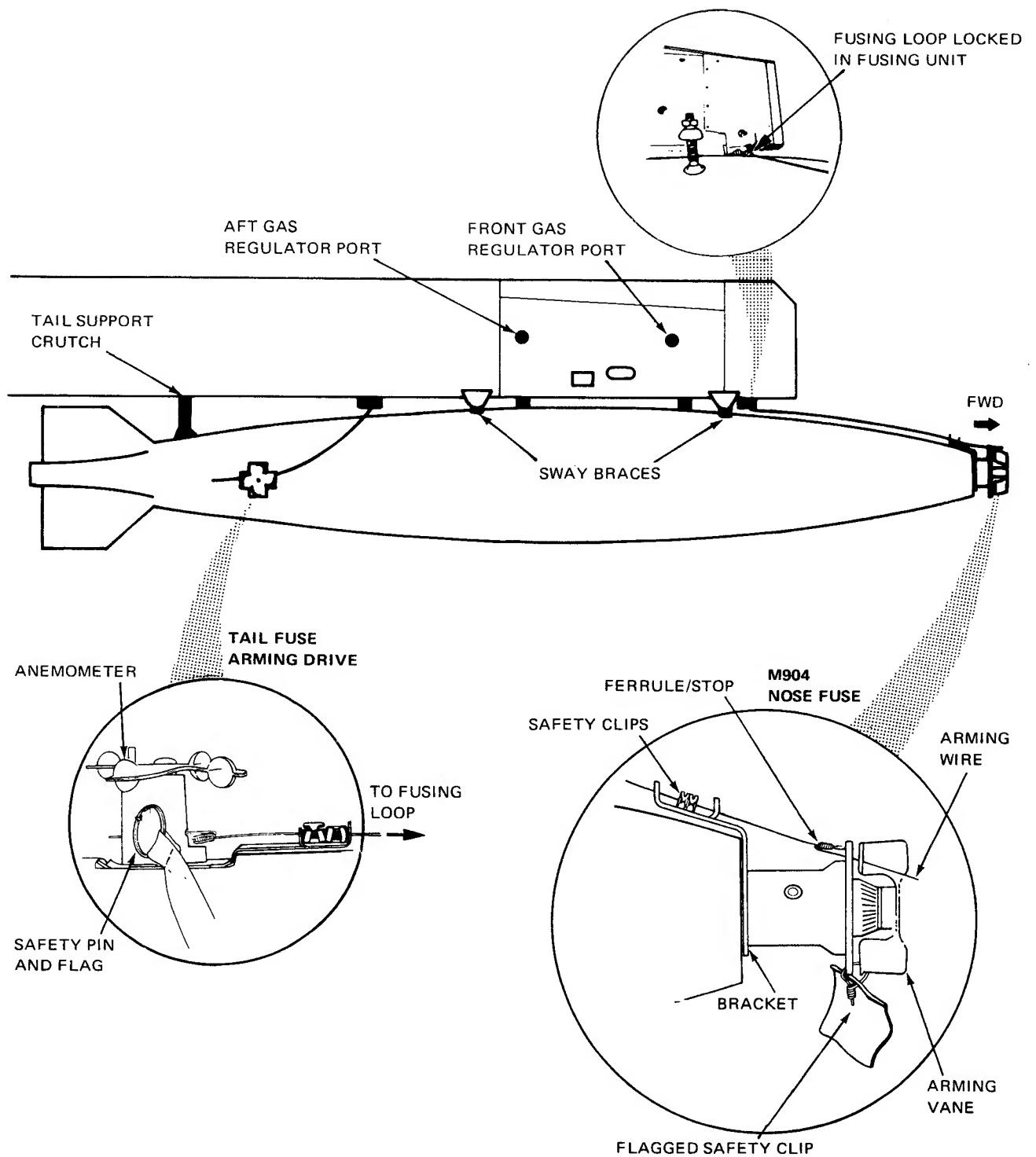
During a safe release, the friction of the two safety clips is sufficient to withdraw the arming loop from the de-energised arming solenoid. Exactly the same method of arming is used for the M905 tail fuse arming vane (refer to Fig 1-34).

#### **MK82 Bomb with Snakeye Tail**

Arming of the FMU-54/B tail fuse and operation of the Snakeye tail is achieved by using a common flexible wire arming system (refer to Fig 1-35).



# **MK82 General Purpose Bomb — Conical-finned**



**Figure 1-31**

## Arming Control System — M904E2 Nose Fuse

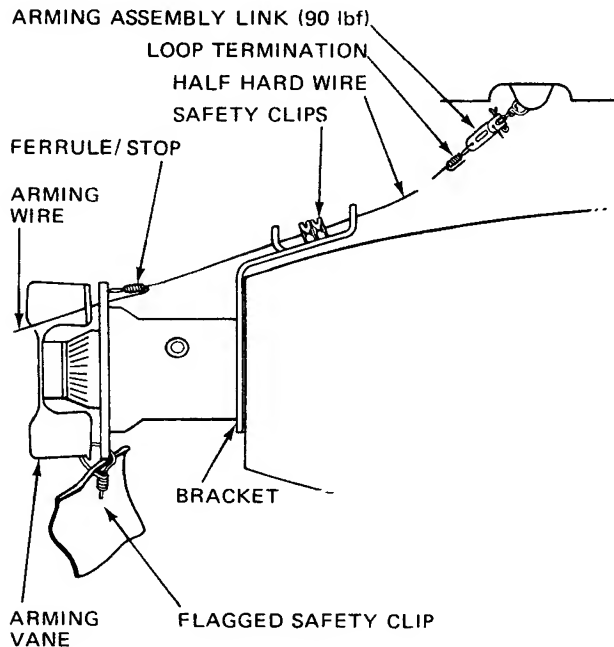


Figure 1-32

## Armed Release — M904E2 Nose Fuse

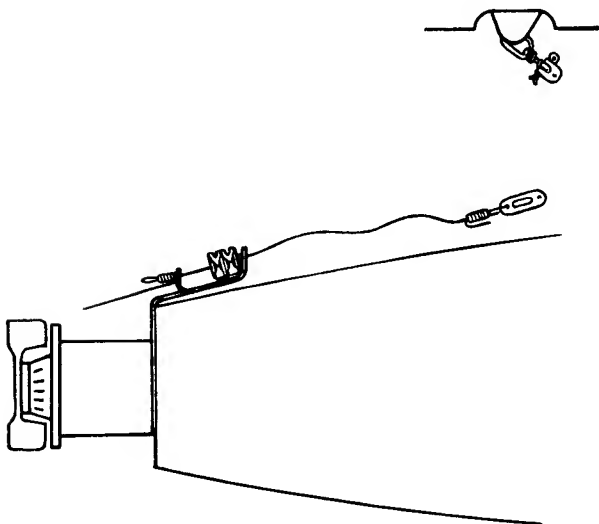


Figure 1-33

## Arming Control System — M905 Tail Fuse

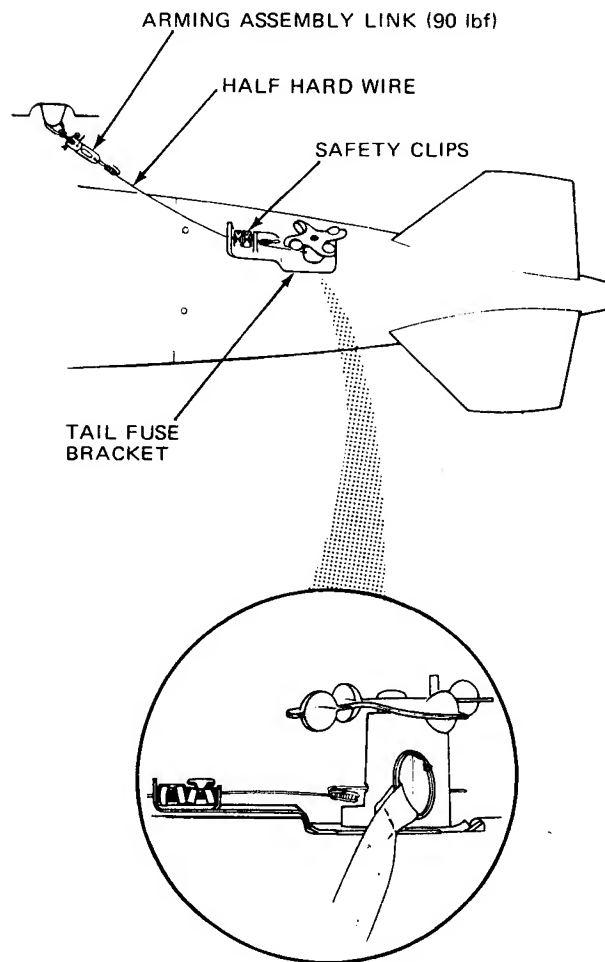


Figure 1-34

During an armed retarded release (tail fusing), the FMU-54/B is armed by withdrawal of the ball-end of the lanyard from the fuse lanyard body. When the bomb separates from the aircraft, the swaged ball-end of the lanyard reaches the bomb charging well and picks up the centre-well link which is attached to the tail retaining pin. After tail opening, the lanyard comes to rest against the bomb's rear suspension lug causing the arming loop shear link to part. All lanyards fall with the bomb; only the arming loop is retained in the arming solenoid.

During a safe release, ie safe, jettison or nose fusing only, the FMU-54/B lanyard is held in the lanyard body with sufficient tension to withdraw the arming loop from the de-energised arming solenoid. Further protection is offered in that 190N (43 lbf) or greater is needed to pick up the centrewell link assembly.

# Arming Control System – FMU-54/B Fuse and Snakeye Tail

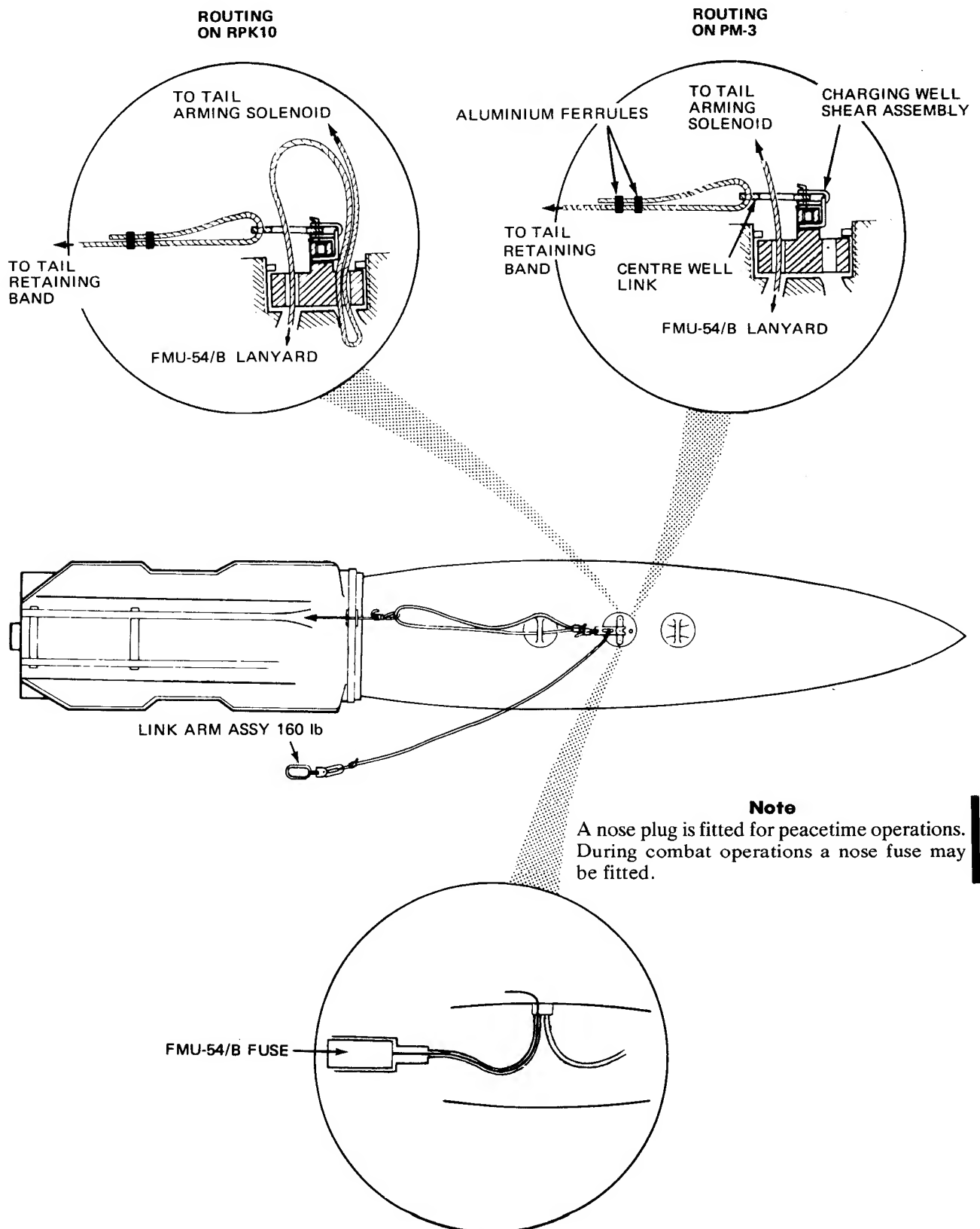


Figure 1-35

The FMU-54/B lanyard is routed as follows :

- a. For the PM-3, which has the tail arming solenoids to the rear of the rear suspension hooks, the lanyard passes from the centre well through the shear assembly directly under the rear ejector foot to the arming solenoid (refer to Fig 1-35).
- b. For the RPK10, which has the tail arming solenoids ahead of the rear suspension hooks, the excess FMU-54/B lanyard is stowed in the forward bomb conduit (refer to Fig 1-35).

#### **GBU-12C/B LASER GUIDED BOMB**

The GBU-12C/B consists of the MK82 bomb and the KMU-388C/B guidance kit. The bomb guidance kit and associated attaching hardware provide a laser terminal guidance capability for the MK82 bomb. No specific weapon fire control system is necessary, ie normal bomb selector switches are employed. The store is mounted directly on the PM-3 or RPK10 bomb carriers. No electrical connections exist between the aircraft and the store; hence, cockpit store monitoring or control functions are not required. Figure 1-35A shows the complete assembly of KMU-388 kit components mounted on the MK82 bomb.

The components that make up the KMU-388 kit are described in the following paragraphs.

#### **Laser Illumination Detector**

The laser illumination detector section of the store consists of an IR dome, the optical equipment, an infrared detector, and the signal mix and pre-amplifier networks. The detector housing is gimbal-mounted by a universal joint assembly. During bomb flight, the detector boresight axis is maintained along the bomb velocity vector by the ring stabilizer. The four-quadrant detector receives invisible laser energy in the near infrared spectrum. This, in turn, generates signals with characteristics that are a function of the detector quadrant or quadrants receiving the energy. These signals, which eventually become both pitch and yaw commands, are directed to the guidance computer.

#### **Bomb Guidance Computer**

The computer receives the detector signals and performs the electronic processes which develop the command signals and operate the guidance control unit. Some of the computer components include the log amplifier, comparator logic, and the control logic circuits. The amplifier video processing circuits amplify the weak (long range) video signals and attenuate the strong (close range) ones in direct proportion to the strength of the signals. This enables the continuous detection of both weak and very strong signals by the same system. The comparator network, receiving the output of the amplifier,

develops the error signals which represent the direction (left or right, up or down) to be taken to correct the flight of the weapon. The control logic converts these error signals into solenoid drive signals which, in turn, operate the proper set of steering solenoids. The control logic also contains circuits which place the commands in a fin trail status if guidance signals are lost or if signal inputs are of insufficient strength.

#### **Bomb Guidance Control**

The bomb guidance control section of the KMU system consists of four movable canards, four solenoids, a thermal battery, and a gas generator. These units provide the drive force which moves the canards in accordance with the commands generated by the computer. Each canard pair, which shares a common shaft, is driven in a bang-bang manner to a total of 5.5 degrees movement in either direction. In the absence of any command, the canards are maintained in the trail position by the airstream.

The thermal battery firing device in the top of the control unit receives the battery arming wire. The wire is routed through the forward sway brace (when the GBU-12C/B LGB is loaded to PM-3) or is routed to the forward attachment hardpoint (when the GBU-12C/B LGB is loaded to RPK10). Guidance is always activated at release. As the store separates from the rack, the arming wire is pulled, activating the thermal battery. Battery voltage is applied to a 3-second delay squib relay; when the relay closes, the bomb power systems are activated. The 3-second delay allows the bomb and aircraft to separate sufficiently before any guidance commands can begin.

#### **Bomb Forward Fairing Assembly**

The forward fairing assembly provides the mounting and interfacing structure between KMU guidance kit and the bomb. The FMU-81/B fuse is installed through the adapter fairing and into the nose fuse well of the bomb. The FMU-81/B is an electrical fuse with a self-contained thermal battery. A fuse arming lanyard is routed internally through the bomb, extended through a lanyard access between the bomb lugs, and fixed in the forward fusing unit of the bomb rack. At bomb release, pulling the lanyard initiates the fuse battery operation.

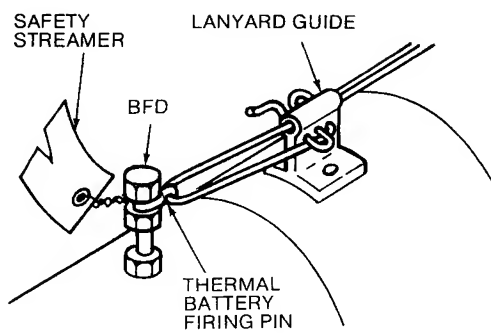
#### **Note**

It is possible to fit a tail fuse either in addition to, or in lieu of, the nose fuse. If a tail fuse is fitted, the arming lanyard is to be connected to the rear fusing unit.

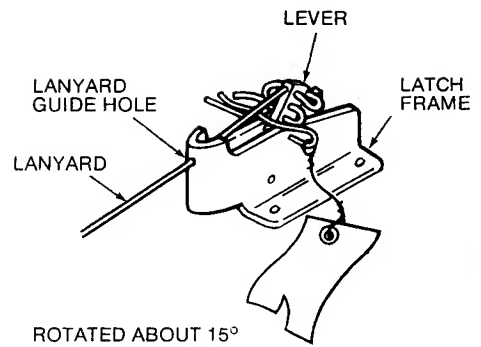
#### **Bomb Wing Assembly**

The KMU wing assembly provides the necessary lift for bomb manoeuvring flight.

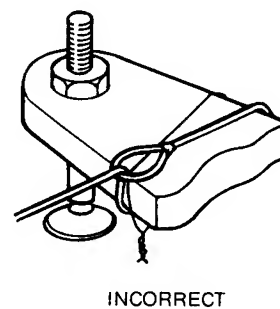
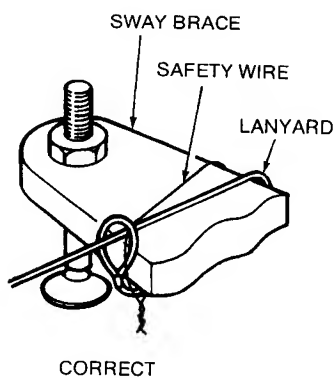
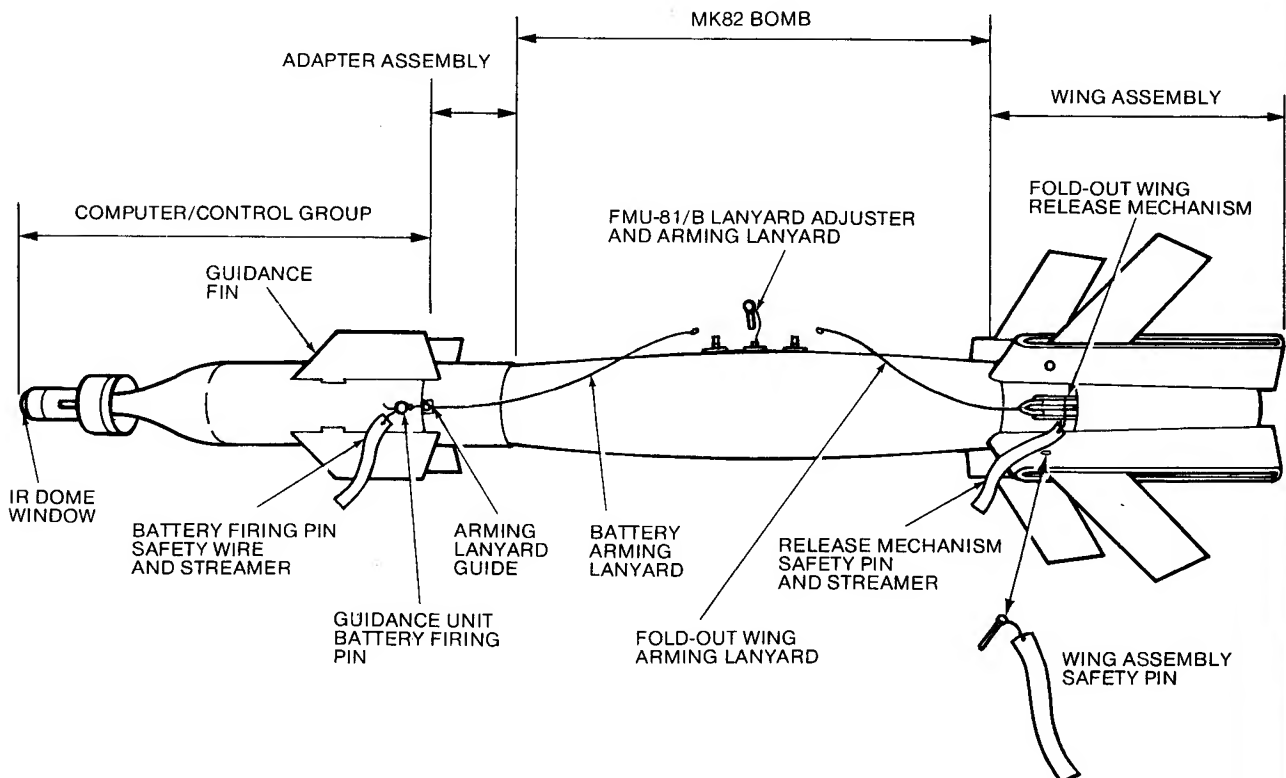
# GBU-12 C/B Laser Guided Bomb



THERMAL BATTERY ARMING LANYARD



FOLD-OUT WING ARMING LANYARD



PM-3 LANYARD ROUTEING

Figure 1-35A

### Mission

The delivery aircraft uses the laser guided bomb in much the same manner as conventional unguided bombs in support of air operations including air superiority, interdiction, and close air support missions. Targets illuminated by a laser are attacked using this system. The bomb guidance system, sensing the laser energy, derives azimuth and elevation steering commands for the movable canards to provide steering to the illuminated target.

Missions may be conducted in the level, dive, or toss bombing modes against targets of opportunity or

against pre-planned targets of known location. The bombing tables assume that the weapon flies an unguided (ballistic) path toward the target. Thus, the weapon guidance system must accomplish only final course corrections. By this procedure, the weapon should impact close to the target if the guidance system malfunctions. Guidance system acquisition of the target prior to release is unnecessary. The weapon flies ballistically until the illuminated target is within the detector field of view and until the reflected energy is strong enough to activate the guidance system.

## NON-NUCLEAR WEAPON FUSES

### M904E2 NOSE FUSE

The M904E2 (refer to Fig 1-36) is an impact-detonated nose fuse designed for use with the MK82 general purpose bomb. It is fitted via two inch threads into an adapter booster in the bomb's forward fuse well.

#### Note

When the nose fuse is not used, a streamlined nose plug is fitted.

The characteristics of the fuse are :

- length— 236 mm (9.3 in);
- thread outside diameter— 50.8 mm (2 in);
- arming delay settings (after pin withdrawal)— 2, 4, 6, 8, 10, 16 and 18 seconds;
- detonation increments (after impact)— instantaneous, 0.01, 0.025, 0.05, 0.10 and 0.25 second.

The fuse consists of an arming vane connected to a governed gear train, the nose assembly with an index mark, the arming delay setting plate, the fuse body and the booster. The arming vane is prevented from rotating on the ground by connecting it to the arming delay setting plate with a flagged safety wire. This

safety wire is removed before flight. The vane is secured in flight by the arming wire which passes through the arming delay setting plate. The arming wire is secured with two safety clips (refer to Fig 1-32).

Arming delays can be set on the ground by setting the index mark on the nose assembly to the desired arming delay etched on the arming delay setting plate. An index pin must be depressed before the nose assembly can be rotated.

### WARNING

Arming delay tolerances must be considered when making release calculations. Release calculations must be computed for the most pessimistic operation, ie fuse arming time plus the maximum tolerance.

#### Note

To reduce the arming delay below six seconds, a stop screw on the body of the fuse must be removed.

### M904E2 Nose Fuse

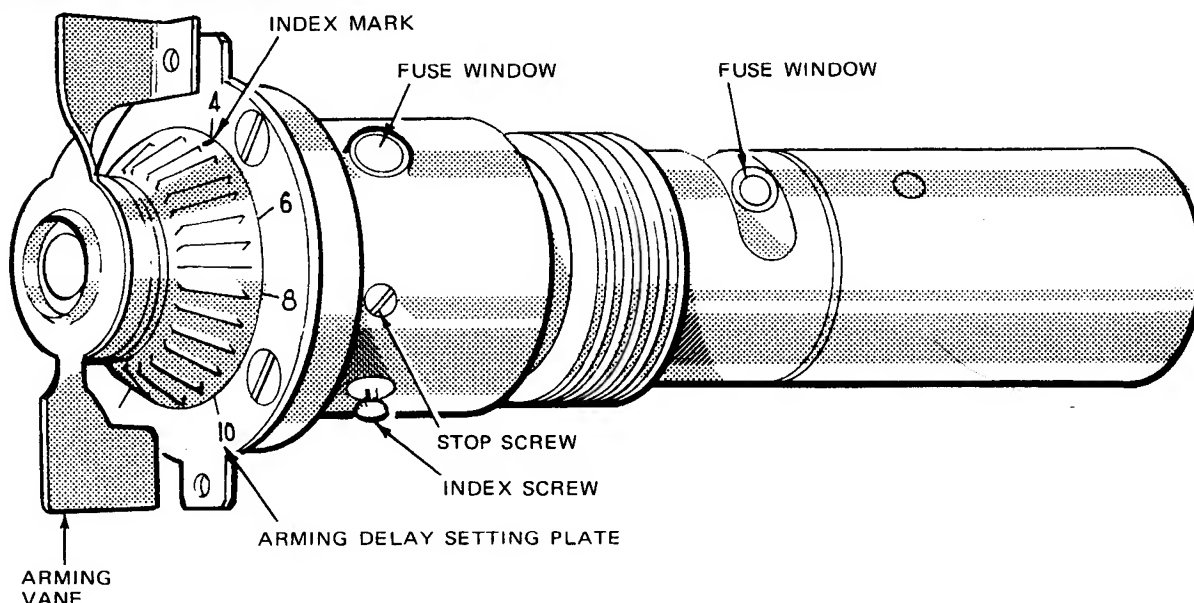


Figure 1-36

The body of the M904E2 fuse contains a receptacle for fitting the M9 detonation delay elements and two pre-flight warning windows. One window is located above the booster and is not visible to aircrew. The second window is located on the fuse body.

**WARNING**

If the window on the fuse body shows fully red, the fuse is unsafe and should not be touched.

When the bomb is released with nose fusing selected, the arming wire is withdrawn from the arming vane and the vane spins in the airstream.

**Note**

Arming time is independent of airspeed. The operating range of the fuse is 150 to 600 knots.

After the arming time has expired, the firing pin and a detonator are aligned. Upon impact, the firing pin is forced into the primer, initiating the explosive train through the delay element.

**M905 TAIL FUSE**

The M905 (refer to Fig. 1-37) is an inertia-operated tail fuse designed for use with MK82 general purpose bombs. It is fitted via two inch threads into an adapter booster in the bomb's aft fuse well.

The characteristics of the fuse are :

- a. length—160 mm (6.3 in);
- b. diameter—50.8 mm (2 in);
- c. arming delay times—4, 6, 8, 12, 16 and 20 seconds and

- d. detonation delay increments—instantaneous, 0.01, 0.025, 0.05, 0.10 and 0.25 second.

The M905 fuse consists of a main body with an input shaft, a rotatable middle body marked with arming delay times and a lower body containing an M9 detonation delay element. To operate the fuse, a governor is attached to the fuse at the input shaft and a flexible shaft connects the governor to an external four cup arming vane drive assembly (refer to Fig 1-34). The drive assembly has two holes drilled in its housing and the shaft to allow the shaft to be locked. A ground safety pin which is removed before flight is inserted into one hole. The arming wire is inserted in the second hole and secured in place by two safety clips. Two warning windows, one in the fuse body and one near the delay element show fully red when the fuse is unsafe.

**Note**

To obtain an arming delay less than six seconds, a stop screw must be removed.

**Operation**

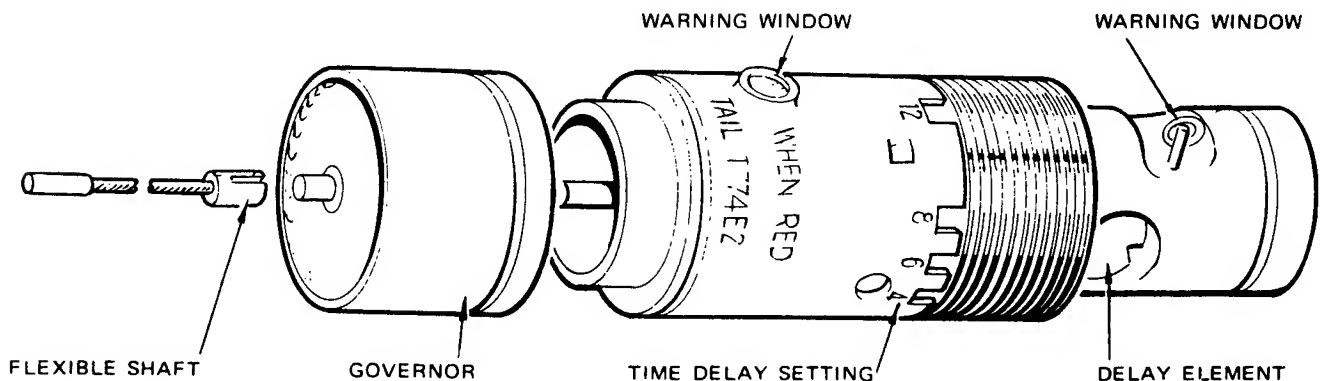
When the bomb is released with tail fusing selected, the arming wire is withdrawn from the drive assembly allowing the arming vane to spin in the airstream.

**Note**

Arming time is independent of airspeed. The operating range of the fuse is 150 to 600 knots.

The drive assembly rotates the flexible shaft which in turn drives the governor and the fuse. When the arming time expires, the firing pin is freed but held away from the primer by an anti-creep spring. At the same time, the detonator is rotated into the firing train. Upon impact, inertia forces the firing pin into the primer initiating the explosive train through the delay element.

## M905 Tail Fuse



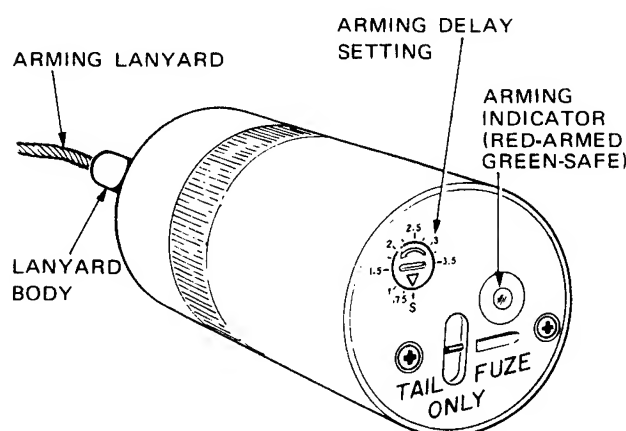
**Figure 1-37**

**FMU-54/B TAIL FUSE**

The FMU-54/B (refer to Fig 1-38) is a retardation-armed, inertia-operated tail fuse for use with retarded weapons.

The characteristics of the fuse are :

- length—165 mm (6.5 in).
- diameter—73.6 mm (2.9 in).
- arming delay settings (after sensing retardations)—0.75 to 3.5 seconds in 0.25 second increments.
- detonation increment—INSTANTANEOUS ONLY.

**FMU-54/B Tail Fuse****Figure 1-38**

The complete fuse consists of :

- the fuse body,
- a detonation element,
- a firing pin assembly,
- a longitudinal 'g'-sensitive bob weight,
- a timer assembly,
- a booster charge, and
- an arming lanyard with a ball-end and a lanyard body assembly.

**WARNING**

Do not handle the fuse if the warning window indicates red. The window is not visible when the fuse is fitted to the bombs.

**Note**

A 67N (15 lbf) pull on the arming lanyard arms the fuse by freeing the bob weight.

During weapon release the lanyard is pulled from the lanyard body freeing the bob weight. After a minimum longitudinal retardation of  $5.5 \pm 0.5$  'g' for

a minimum of 0.6 second the bob-weight allows the timer to run. This movement of the bob-weight ensures that the bomb is safe in the event of the tail failing to open. The timer, after its preset delay (which includes the 0.6 second) aligns the detonator with the firing pin. On impact, the inertia-operated firing pin detonates the fuse train.

**CAUTION**

Tests show that the timer accuracy may be in error by up to plus 0.8 second. Therefore, the release conditions should be chosen to allow a bomb time of flight of one second greater than the timer setting otherwise an unexploded bomb (UXB) may result.

**Note**

Recommended minimum arming delay is 2.5 seconds.

**FUSE ARMING TIME TOLERANCES**

The arming time tolerances for the M904 Series, M905 Series and FMU-54/B fuses are shown in Figure 1-38A.

**Arming Time Tolerances**

Fuse Type	Applicable Tolerances (% of Fuse Arming Delay)
M904 Series	$\pm 10\%$
M905 Series	$\pm 20\%$
FMU-54/B	Arming delay set with error of up to +0.8 Sec

**Figure 1-38A****FMU-81/B SHORT DELAY FUSE**

The FMU-81/B short delay bomb fuse is cylindrically shaped, 75 mm (3 in) in diameter, and 280 mm (11 in) long. The fuse and components (refer to Figure 1-38B) are used with compatible munitions to assemble a completely fused munition. The FMU-81/B fuse is compatible with the nose and/or tail fuse wells of all low drag bombs with internal plumbing and the standard 75 mm (3 in) fuse well.

The FMU-81/B fuse is also intended for use with guided bombs.

The FMU-81/B consists of three major assemblies: fuse, FZU-2/B fuse booster, firing lanyard adjuster (MAU-162/A) and lanyard assembly. An auxiliary booster clip is provided as an accessory for guided bomb applications.

The fuse consists of a body, nose, safety clip, thrust washer, booster clip, battery firing device (BFD), lanyard assembly, hitch pin with warning tag, and safety pin. The body is a steel cylinder with a window near the end opposite the nose. Contained within the body are a battery, a safing and arming mechanism (S & A), and an electronic assembly. The nose is a



## FMU-81/B Short Delay Fuse

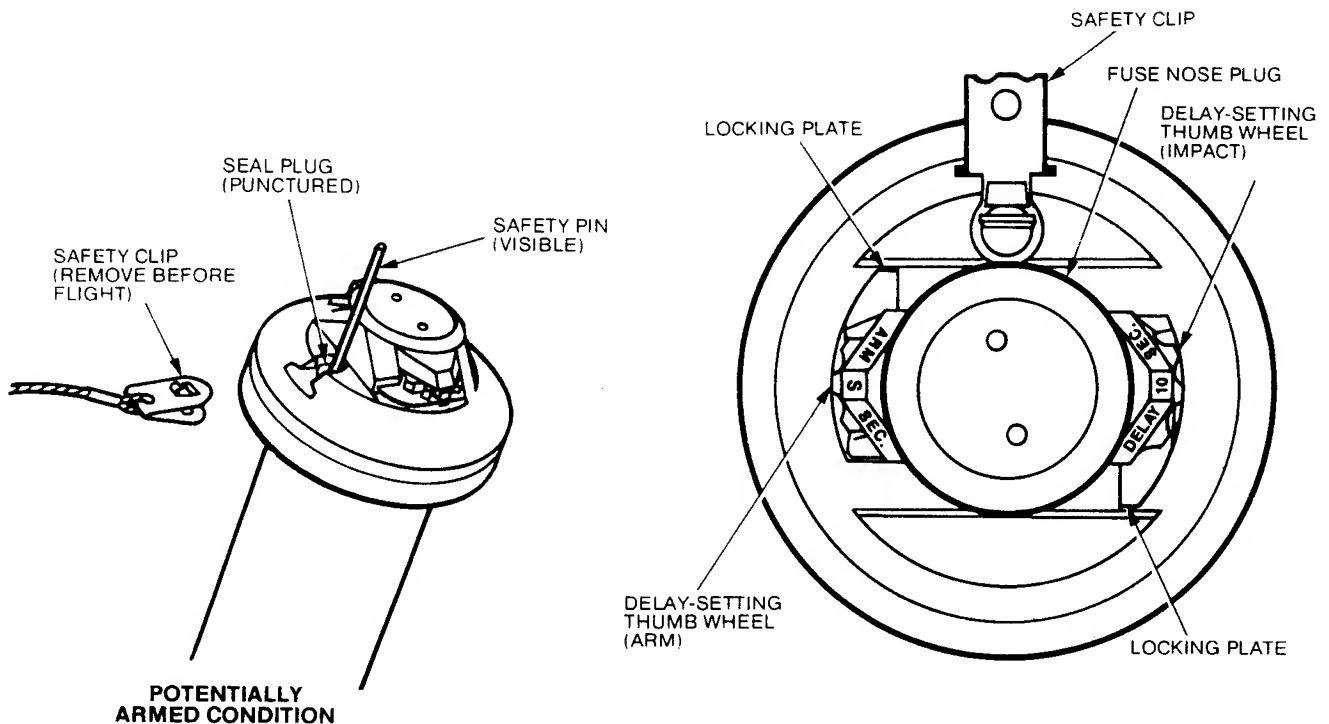


Figure 1-38B

cone-shaped casting 106 mm (4.2 in) in diameter, integral with the fuse body. It contains two setting thumbwheels, one for arming delay and one for impact delay. The thumbwheels are held in place by a fuse nose plug and connected to selector switches in the electronics assembly by two mating shafts. A seal plug and safety clip with warning tag complete the unit. The thrust washer is a spacer surrounding the fuse body at the base of the nose and has an outer diameter of 110 mm (4.35 in). The thrust washer is used only when the fuse is installed in the nose fuse well. The booster clip is a spring-steel holder that fits into the booster recess at the end of the fuse body. The BFD is a steel cylinder integral with the fuse body that protrudes from the recessed end of the body. It contains a firing pin held in restraint by a shear wire until initiated by a pull from the lanyard. The lanyard assembly is a braided steel cable connected to the BFD by a ball and shank. The hitch pin is a safety pin inserted in a hole in the BFD housing and lanyard rod. This pin is removed before fusing the bomb. The safety pin is a slender steel rod that is visible through the window in the fuse body and extends through the body and nose to the seal plug.

The fuse booster is shaped to fit the contour of the fuse booster cavity and it is snapped into position under the booster clip.

The firing lanyard adjuster (MAU-162/A) consists of a lanyard tie-off block, a pull ring, and a shear

wire. The auxiliary booster clip is a spring-steel holder that holds three supplementary boosters in place around the BFD when the fuse is used in a guided bomb.

### Safety Features

A SAFE position on the arming-delay-setting thumbwheel renders the arming circuit inoperative. Locking plates behind the arming-delay and impact-delay setting thumbwheels prevent accidental movement of the thumbwheels during ground handling of the fuse. A safety pin reveals a potentially armed condition of the fuse by visibly protruding through a seal plug on the fuse nose. The safety pin holds the rotor out of line until the pin is driven through the plug by the arm-enable bellows.

### WARNING

If the safety pin is protruding through the seal plug in the fuse nose, the fuse shall be considered armed. In this event, the fuse shall not be used. Do not touch the fuse; notify armament personnel immediately.

A safety clip on the fuse nose prevents the safety pin from releasing the rotor until the safety clip is manually removed during installation in a bomb. If the BFD is accidentally initiated during handling,

the safety pin permanently locks the safety clip in place to reveal a defective fuse condition to the armorer. A hitch pin prevents actuation of the BFD until manually removed during bomb loading.

The S & A provides out-of-line safety until the rotor is freed by movement of the safety pin and propelled in line by an arming bellows after BFD initiation. If an impact of greater than 250 'g' occurs prior to arming, the safing switch and/or the detonator enable switch functions and prevents the fuse from arming. If an arming signal is generated prior to arm-enable (removal of the safety pin), the rotor attempts to rotate and deforms a locking tang, which then permanently locks the rotor out of line. The S & A also prevents battery voltage from reaching the event circuitry before mechanical arming occurs.

The arm-enable circuitry prevents premature actuation of the arm-enable bellows by means of a resistor-capacitor combination that limits the enable-bellows charging current until the preset timing circuit releases a voltage pulse and triggers the capacitor to discharge into the bellows.

#### **Arming Delay**

Any of nine arming-delay settings (4, 5, 6, 7, 8, 10, 12, 14 or 20 seconds) or a SAFE setting can be selected by means of the setting thumbwheels (refer to Fig 1-38B) of the arming-delay selector switch. The tolerance on the arming delay is  $\pm 5\%$ . The arming-delay settings may be made before or after installation of the fuse in the bomb.

#### **Impact Delay**

Any of six impact-delay settings (0.00, 0.01, 0.02, 0.05, 0.10 or 0.25 second) can be selected by means of the setting thumbwheels (refer to Fig 1-38B) of the impact-delay selector switch. The impact-delay settings may be made before or after installation of the fuse in the bomb.

The fuse can be used more advantageously in the nose fuse well. Nose installation permits inspection by the aircrew and changes of arming and event time settings if such changes are required after initial loading. If the tail fuse well is used, the removal of the safe and arm safety clips cannot be verified by external inspection of the bomb, and the removal of the safety clip immediately prior to launch requires the removal and reinstallation of the tail fin access cover. Also, when returning to base with unexpended or hung bombs, timely verification of the armed/unarmed status of the tail fuse cannot be ascertained by external inspection of the bomb.

#### **Operational Sequence**

Upon bomb release, a lanyard pull of 9 kg (20 lb) or more shears a pin in the BFD and releases the BFD firing pin. The firing pin initiates a primer cap which, in turn, initiates heat paper within the battery. The heat paper raises the battery temperature to generate battery voltage. After a battery rise time of 0.4 second  $\pm 0.125$  second, the battery produces 11 volts to operate the timing and control circuitry in the fuse. At about three quarters of the set arm time, the enable bellows motor activates and removes the safety pin block on the S & A. At the set arm time, the arming bellows motor activates and moves the detonator to the in-line position. On impact, the fuse functions after the preset impact delay has elapsed.

A safety clip on the fuse nose prevents premature fuse arming. This clip should be removed before flight.

#### **WARNING**

If the seal plug in the nose of the fuse has been punctured and the safety pin protrudes, the fuse is armed. Do not touch the fuse; notify armament personnel immediately.

## **NON-NUCLEAR TRAINING WEAPONS**

### **MATRA R530KE TRAINING MISSILE**

The Matra R530KE missile is a training version of the operational missile which permits flight training for aircrew without the danger of accidental firing. The missile is white with a two inch blue band on the body adjacent to the fiberglass nose section.

#### **DESCRIPTION**

The Matra R530KE contains a normal homing head, but all other components except the DC/AC inverter regulator assembly are replaced by ballast. External physical characteristics are similar to the operational

missile, except for the absence of the proximity fuse antennae, the warhead safety plug and the exhaust cone which is replaced by a flat plate across the rear end of the missile. This plate contains a relay which is used to simulate missile launch. A steel pin is installed in the forward attachment fitting of the training missile to provide added security of the missile on the launcher.

### OPERATION

Operating indications of the R530KE missile are similar to the R530K missile up to launch. If the R530KE only is carried, the MISS STND-BY switch can be left OFF until the missile is required. However, the MISS STND-BY switch should be selected ON at least two minutes prior to radar lock-on. To reset the R530KE training missile after a simulated launch, the MISS STND-BY switch must be placed momentarily OFF. This operation re-inserts the electromagnetic latch and cancels the missile gone signal to the Cyrano IIB radar.

### CAUTION

The MISS STND-BY switch should be momentarily selected OFF prior to landing to ensure that the electromagnetic latch is engaged for landing.

#### Note

- When carrying both S.W. and Matra, the MISS STND-BY switch must be selected ON prior to taxiing and OFF prior to engine shut down.
- To receive either masking tone or lock-on tone, all appropriate switches must be on (refer to Sect 2).

### MATRA R550 TRAINING MISSILE

The R550 training missile (refer to Fig 1-39A) permits pilot familiarization and target acquisition training without actual firing of the missile. It is also used for familiarizing ground personnel with the various operations of assembling, testing and installing the missile under the aircraft. During a flight, the significant parameters of the mission can be stored in a recorder located aft of the rocket motor ballast.

The training version can be distinguished from the operational version by its blue colour, lack of front fins and control surfaces, and reduced wing height. The fins, control surfaces and wings have been modified in order to reduce stress on the launcher rail during flight. Also visible on the forward sections are two hour-meters for monitoring running hours of the cooling device and homing head modulator (first meter) and indicating the total running time of the homing head, the electronic box and the recorder (second meter).

### MATRA R550 TRAINING MISSILE OPERATION

Simulated firings of the Matra R550 training missile require the same switch selections as for the operational missile. When the training missile load (1 or 2 missiles) has been 'launched' during training missions, the missile system must be reset before another simulated launch can take place. To reset the missile system, the Dogfight mode must be deselected then reselected either by use of the rotary selector on the weapons system control panel or by pressing the green Dogfight light button. After this reselection, the system may take from 4 to 35 seconds before coming on line.

### INERT (BALANCING) MISSILE

The inert R550 missile is similar to the training version in dimensions, weight and balance, structural designs and appearance. Orange in colour, the inert missile is intended to be loaded as a balancing missile to provide a symmetrical load when a single operational or training missile is carried. Alternatively, two inert missiles may be carried for handling/flight testing.

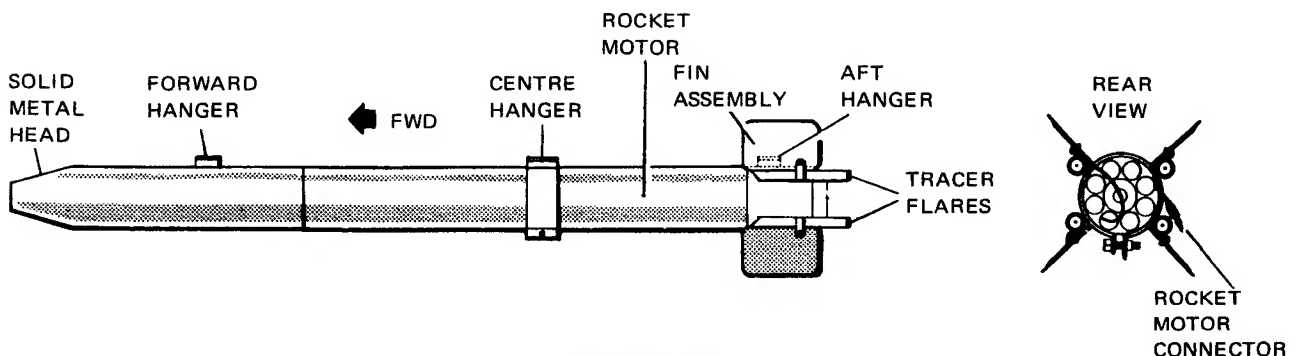
### TDU-11/B TARGET ROCKET

The TDU-11/B target rocket (refer to Fig 1-39) is a high velocity aircraft rocket (HVAR) used as a target for exercises in firing of the operational Sidewinder missile. It is suspended from the Aero 3B launcher on either wing station.

### DESCRIPTION

The physical characteristics of the rocket are :

- a. length—2.0 m (6.3 ft),
- b. diameter—127 mm (5 in),
- c. fin diameter—400 mm (1.3 ft), and
- d. weight—98.7 kg (218.5 lb).



**Figure 1-39**

## Matra R550 Training Missile

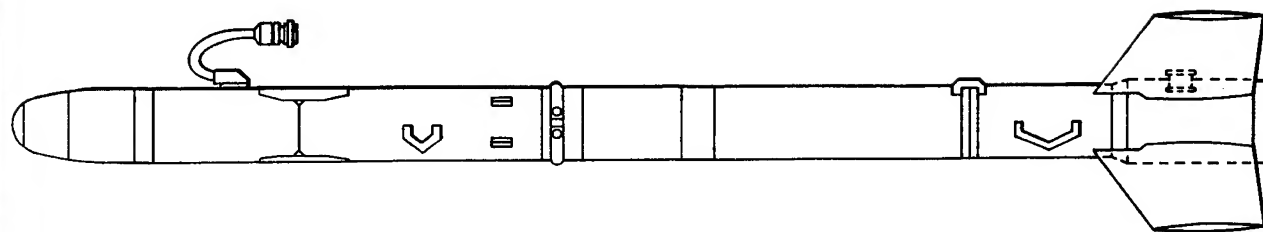


Figure 1-39A

The rocket has a metal nose section with the forward hanger mounted on its surface. The nose section is painted blue and the rocket motor, with the centre hanger, is light grey. A fin assembly stabilizes the unguided rocket in flight. Four tracer flares are mounted on the tail surfaces.

### OPERATION

The TDU-11/B target rocket is a simple ballistic rocket. The rocket is normally loaded on the left wing of the Mirage with an operational S.W. on the right wing but other configurations are possible (refer to DI(AF) AAP 7213.003-1, Section 5). The rocket is fired by selecting the switches for firing S.W. with the SINGLE/SALVO switch at SINGLE. The rocket motor is ignited by an electrical signal through the AERO-3B launcher and a rocket motor connector. As the rocket motor ignites, the four flares on the aft of the rocket are lit, providing an IR source for the operational Sidewinder missile. After firing the target rocket, the SINGLE/SALVO switch must be placed in SALVO to monitor and fire the Sidewinder.

### Note

With the target rocket carried on the left wing and an operational Sidewinder on the right, firing with the SINGLE/SALVO switch in SALVO results in the Sidewinder firing first followed 2 secs later by the target rocket.

## BDU-33C/B PRACTICE BOMB

### DESCRIPTION

The blue coloured BDU-33C/B practice bomb (refer to Fig 1-40) has a teardrop-shaped cast metal body, to which is fitted a conical afterbody with a central tube and cruciform type fins. A metal cup can be fitted to the cruciform fin to alter the drag characteristics of the bomb to simulate a high-drag store. Either of two opposed index holes, marked with white arrows, engage the ejector foot of the SUU-20A/A bomb dispenser. A threaded cavity just forward of the bomb's CG provides for fitment of a lug which is not used with the SUU-20A/A.

The nose of the BDU-33C/B houses a spotting charge and a firing pin assembly in the central tube. The spotting charge is fitted first followed by the firing pin assembly which consists of a crushable rubber striker cup and a firing pin. A red-flagged safety pin is inserted between the firing pin and the spotting charge holding the charge clear of the firing pin. The safety pin is removed during the pilot's pre-flight.

### Note

With the safety pin removed, the bomb will operate if dropped vertically from a height of 47.5 cm (18 in).

## BDU-33C/B Practice Bomb

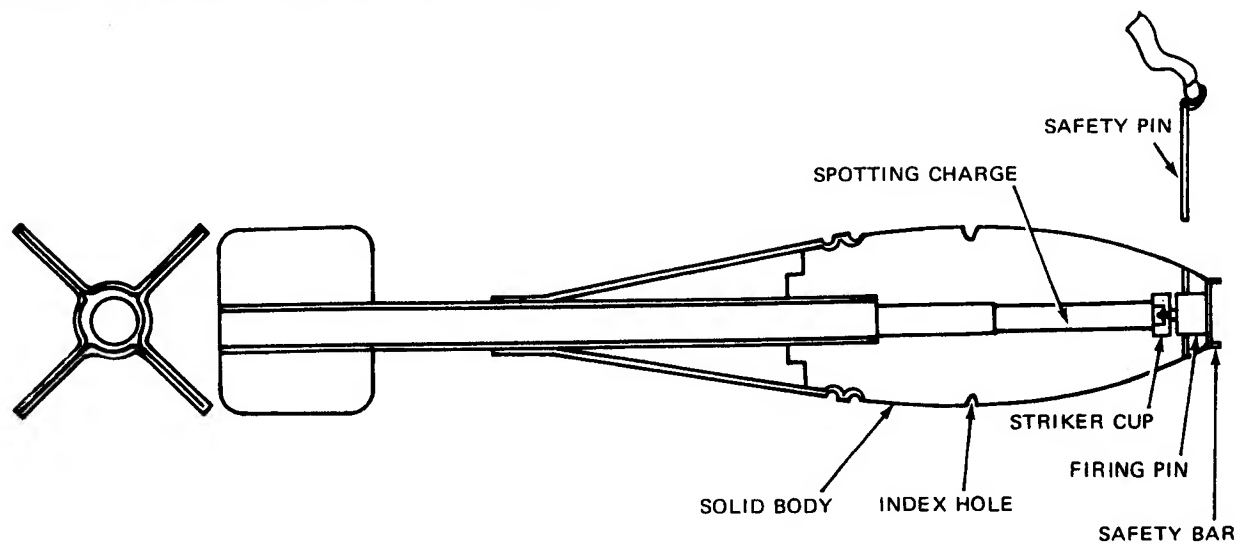


Figure 1-40

## ELECTRONIC COUNTERMEASURE EQUIPMENT

### AN/ALQ-72 ECM Pod

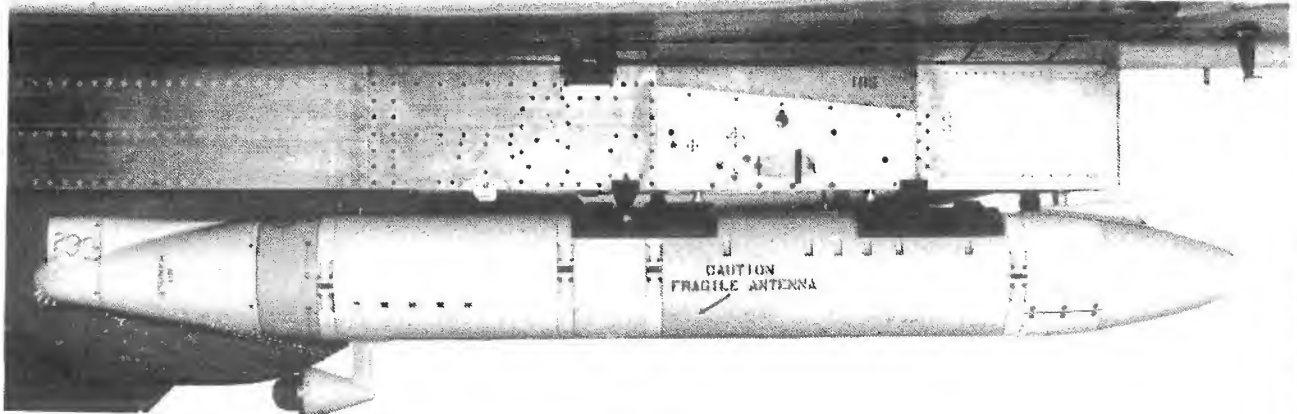


Figure 1-41

The physical characteristics of the bomb are :

- length—568 mm (22.375 in),
- diameter—101.6 mm (4 in),
- fin span—142.75 mm (5.62 in), and
- weight—10.8 kg (23.8 lb).

#### OPERATION

BDU-33 practice bombs are carried in the SUU-20A/A practice bomb dispenser attached to the fuselage centreline station. The Alkan PM-3 bomb beam is utilized to enable SUU-20A/A attachment to this station. Each SUU-20A/A dispenser carries a maximum of six bombs.

Upon impact, the spotting charge is driven forward crushing the rubber cup and striking the firing pin. The primer is pierced and fires the spotting charge which produces a flash and a cloud of white smoke to designate the impact point for night and day operations.

All Mirage IIID and a limited number of Mirage IIIO aircraft have been modified to carry the AN/ALQ-72 ECM pod and the Lundy AN/ALE-32 chaff dispenser.

#### AN/ALQ-72 ECM POD

The AN/ALQ-72 ECM pod (refer to Fig 1-41) can be fitted to the front station of PM-3 bomb beams with Weapons Modification 7334.002-108 (an extended nose fairing) incorporated. The ECM pod, which is not jettisonable, and the modified bomb beam are carried on the centreline station of suitably modified aircraft. Approved configurations are detailed in DI(AF) AAP 7213.003-1, Sect 5.

#### DESCRIPTION

The ECM pod is 2.54 m (100 in) long and weighs about 90 kg (200 lb). The pod requires both AC and DC power for operation. The AN/ALQ-72 is capable

of operating in four modes. The modes of operation are classified and information about them is contained in appropriate user publications.

#### CONTROL UNIT

The control unit (refer to Fig 1-42) is mounted on the right console. It is designed to operate two ECM pods. Only the lights with the figure 1 on the face are applicable to Mirage operations.

### AN/ALQ-72 Control Unit

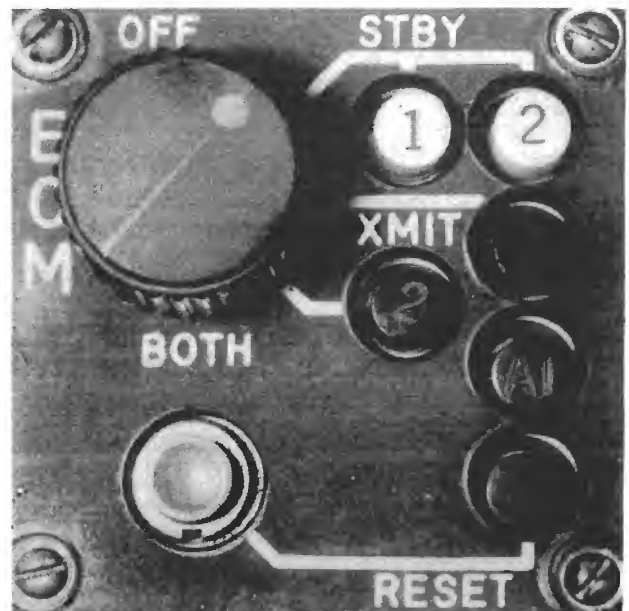


Figure 1-42

#### OPERATION

During taxiing, switch the set to STBY no more than three minutes before take-off to avoid overheating. The white STBY 1 light illuminates about three minutes after switch on. When jamming is desired,

the set is switched to XMIT 1 and the preset mode of ECM is then in active operation. STBY may be reselected as required during the sortie; however OFF should not be selected until after landing checks or in an emergency situation.

### CAUTION

Because the AN/ALQ-72 causes severe interference with GCA and similar radars, the pod should be selected to XMIT 1 only when the aircraft is within a declared ECM training area or as otherwise specifically required.

### Note

- If Cyrano radar is fitted, the radar must remain in STND-BY whenever the AN/ALQ-72 is selected ON to avoid overloading and overheating the alternator.
- The selector knob has to be depressed to select XMIT 1.
- When the AN/ALQ-72 and a chaff dispenser are carried together, the Cyrano radar is to be operated in STND-BY and RANGE. Cyrano radar malfunctions are indicated by illumination of the warning light on the dummy radar scope panel. If the light illuminates, the radar master switch is to be selected OFF and the aircraft operated in accordance with the limitations specified for radar OFF.

### OPERATING AND HANDLING CHARACTERISTICS

The aircraft exhibits no handling abnormalities through the entire ECM pod operating speed and height envelope. The AN/ALQ-72 is not jettisonable.

### IN-FLIGHT LIMITATIONS

The AN/ALQ-72 in-flight limitations are detailed in DI(AF) AAP 7213.003-1 Sect 5.

### POD MALFUNCTION

Pod malfunction is indicated by illumination of the red RESET light. Procedures and a schematic fault finding chart are contained in Section 3.

### LUNDY AN/ALE-32 CHAFF DISPENSER

The chaff dispenser can be fitted to the left inboard wing station of appropriately modified aircraft in place of the left 110 gal tank. The dispenser is not jettisonable. Approved configurations are detailed in DI(AF) AAP 7213.003-1, Sect 5.

### DESCRIPTION

The dispenser is set in a modified 110 gal tank and weighs 163.7 kg (361 lb) fully loaded and 122.8 kg (271 lb) empty. The nose of the pod (refer to Fig 1-43) swings upwards for loading and is latched in the down position for flight. Internally, the pod consists of three spring-loaded chaff magazines and the dispenser unit. The chaff pod is capable of carrying 270 packets of narrow-band chaff. The chaff packets

are individually extracted from the magazines by three pawls and ejected at about 30 ft/sec by a set of rollers through an opening beneath the pod. During extraction the chaff packet seal is slit and upon entering the airstream opens to yield the chaff. Dispensing rates of 6 to 480 packets per minute can be selected by the pilot. The pod requires both AC and DC power to operate and is protected by a circuit breaker, labelled CHAFF DISP, located on the main circuit breaker panel.

### WARNING

The POWER switch should be checked OFF prior to pre-flight and personnel should be kept clear of the dispenser unit.

## AN/ALE-32 Chaff Dispenser



Figure 1-43

### HANDLING CHARACTERISTICS

#### Taxiling

The aircraft tends to diverge slightly to the right due to the heavier load of the fuel in the right 110 gal fuel tank.

#### Take-off

The aircraft tends to diverge slightly to the right. Take-off roll trim should be set at the initial illumination of the left trim light.

#### In-flight Limitations

The in-flight limitations are detailed in DI(AF) AAP 7213.003-1, Sect 5.

#### Landing

With the right 110 gal fuel tank empty, a normal landing is possible. If the right 110 gal tank contains fuel, make a 180 KIAS touchdown; the normal crosswind limit of 20 kn is acceptable.

## Chaff Dispenser Control Unit

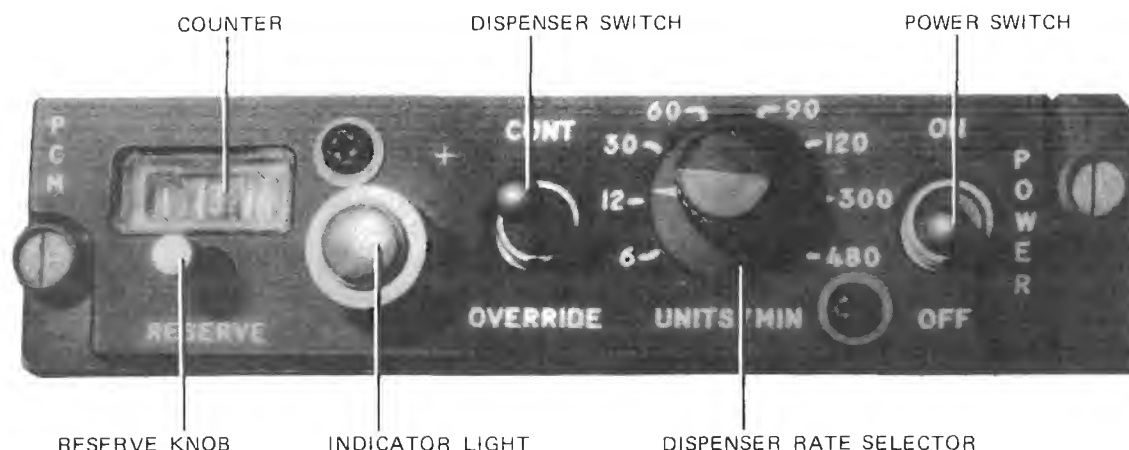


Figure 1-44

### Fuel Management

The CROSSFEED switch should remain ON until the fuel from the right 110 gal fuel tank is exhausted.

### Dispensing Limitations

Dispensing limitations are detailed in DI(AF) AAP 7213.003-1, Sect 5.

### CHAFF DISPENSER CONTROL UNIT

The control unit (refer to Fig 1-44) is mounted in the radar panel well on the instrument panel. The control unit has the following controls :

- a. **Power Switch.** When selected ON this switch supplies power to the ejector mechanism motor.
- b. **Dispenser Rate Selector.** This selector controls the rate of packets dispensed per minute when the dispenser switch is set to CONT.
- c. **Dispenser Switch.** This three-position switch performs the following functions :
  - (1) CONT - In this position the dispenser operates at the pre-set rate.
  - (2) Centre Position - In this position the dispenser is inoperative.
  - (3) OVERRIDE - In this position the pod dispenses at the maximum rate of 480 packets/min regardless of the rate selector position.

### Note

The switch must be held in the OVERRIDE position as it is spring-loaded to the centre (off) position.

- d. **Indicator Light.** This light flashes on as each packet is dispensed. The light remains on if the dispenser magazine is empty or jammed.
- e. **Counter.** When pre-set to the total number of packets loaded prior to dispensing, it indicates packets remaining.
- f. **RESERVE Knob.** When rotated, this knob alters the counter.

### CAUTION

Because chaff may constitute a hazard to livestock, chaff dispensing is to take place only in promulgated military flying training areas located entirely over the sea or in meteorological conditions that ensure a seaward drift to the dispensed chaff.

- [D]** The control unit is mounted on the centre pedestal.



## HIGH PERFORMANCE AERIAL TARGET SYSTEM STAGE 1

The High Performance Aerial Target System Stage 1 (HIPATS-1) provides for the air launch of a radar responsive target which can be towed at speeds up to 350 knots and altitudes up to 30 000 ft. The target system is used to train aircrew in advanced air-to-air gunnery.

### DESCRIPTION

The major-components of the HIPATS-1 are :

- a. a non-jettisonable canister assembly.
- b. a tow cable assembly, and
- c. a target assembly.

The canister assembly, complete with the tow cable and target assemblies, is carried on the PM3 bomb beam rear station. Power for the ejection, release and emergency release functions is supplied from the aircraft bombing system, through the PM3 bomb beam to the target system canister.

### OPERATION

When the deployment circuit is selected and energized, an ARD863-1 impulse cartridge fires and the ejection gun forces the target rearwards out of the canister. The tow cable is extracted by the target and when all the cable has been extracted from the canister the target is snatched into the tow position. Furling straps are removed and the air flow effects deployment. The target assumes a cruciform shape consisting of a staff and four radial arms from which rectangular mesh panels stream. The panels are treated to enhance visual acquisition and a luneberg lens attached to the rear of the staff provides satisfactory radar reflectivity. When the target is deployed it is ready for gunnery practice.

When the gunnery practice is completed, the target and tow cable are released from the canister and dropped into a predetermined drop zone to be recovered by ground personnel. Normal release is achieved by selecting and energizing the normal release circuit which fires a detonator fitted in an explosive bolt. When detonated, the explosive bolt shears and the cable falls away from the towing aircraft. Emergency release is achieved by selecting and energizing the emergency release circuit which fires a second detonator fitted in the explosive bolt.

### OPERATING AND HANDLING CHARACTERISTICS

#### Target Launch

When the bomb release button is pressed, ejection of the target is felt in the cockpit as a short sharp jolt. A slight rumbling vibration is felt during cable payout. The end of cable payout is marked by a jerk similar to that felt during brake parachute deployment but of a slightly less magnitude. There is a similar nose-down pitching motion of the aircraft which can be checked by about 1 cm aft stick movement. The

initial jerk is followed by two noticeable, heavily-damped, longitudinal surging motions. After launch, engine power is required to be raised from about 7700 RPM to 7850 RPM to maintain 220 KIAS at 2000 ft altitude. Level flight can be maintained during launch at 20 000 ft on full dry power. After high altitude launches (20 000 ft), the aircraft is bunted into a dive of up to 20° to accelerate to towing speeds. About 5 minutes and 35 seconds and 74 gallons of fuel are required to accelerate from 220 KIAS to 340 KIAS/0.73 IMN at 20 000 ft in level flight. Cable failure during target launch is characterized by a weaker than normal jolt seven to eight seconds after ejection and the absence of subsequent longitudinal surges.

#### During Tow

Aircraft handling during straight and level tow at 200 KIAS, 270 KIAS and 350 KIAS is only affected to a minor degree. The most noticeable effect observed during manoeuvring flight is reduced aircraft turning performance and reduced aircraft performance in general. The following provisions apply :

- a. Entry into a left or right turn at 200 KIAS requires 1cm to 2cm of into-turn rudder pedal deflection for balanced flight.
- b. Light longitudinal pulsing is occasionally felt after establishing a steady banked turn from level flight.
- c. Accurate control of airspeed below about 270 KIAS is difficult and requires constant power adjustments. This is particularly noticeable at altitudes above 15 000ft.

#### Target Release

Aircraft handling immediately before and during release at 220 KIAS is characteristically sluggish with no noticeable target effect other than the increased RPM required to maintain 220 KIAS (as during the launch). Release of the target when the bomb release button is pressed is not easily noticed, the only symptom being a momentary forward surge of the aircraft. The motion is usually masked by turbulence or buffet and verification of target release is normally sought from the chase pilot or the tower controller.

### AIRCRAFT PERFORMANCE — TARGET TOWING OPERATIONS

Aircraft-performance during target towing operations is shown in Figure 1-45.

#### INFLIGHT LIMITATIONS

The HIPATS inflight limitations are detailed in DI(AF) AAP 7213.003-1, Section 5.

#### CANISTER MALFUNCTION

Canister malfunction is indicated by non-deployment of the target and tow cable or non-release of the target and tow cable.



## **Aircraft Performance — Target Towing Operations**

CONFIGURATION : 2 × 110 gal FUEL TANKS

CLIMBS : ALL FULL DRY POWER

PM-3

HIPATS-1

Description	Altitude (feet)	Speed (KIAS/IMN)	Result
<b>Target Stowed</b>			
Time to climb	Brakes release to 30 000	400/0.9	8.3 min Fuel used : 212 gal
Cruise 1	18 000	438/0.9	Fuel flow : 12.8 gal/min at 8160 RPM
Cruise 2	500 AGL	450/0.7	Fuel flow : 15 gal/min at 7980 RPM
<b>Target Towing</b>			
Time to climb	3250 to 10 000	350	3 min (ROC : 2250 ft/min)
Time to climb	18 000 to 20 000	300	2 min (ROC : 2000 ft/min)
Cruise	15 000	300	Fuel flow : 10.0 gal/min at 8140 RPM
Circular tow 45° bank	10 000	270	Fuel flow : 12.0 gal/min
Max rate turn at 3.0 'g' amber/red incidence	22 000 to 10 000	350	12 000 ft altitude lost in one 400° turn on full dry power, 90° AOB, 20° nose-down.
Absolute ceiling at zero rate of climb		300	26 500 ft (approx) on full dry power
Average towing time	10 000	300	25 min
Return to base from 40 NM, target release to shut-down	10 000	300	160 gal

**Figure 1-45**



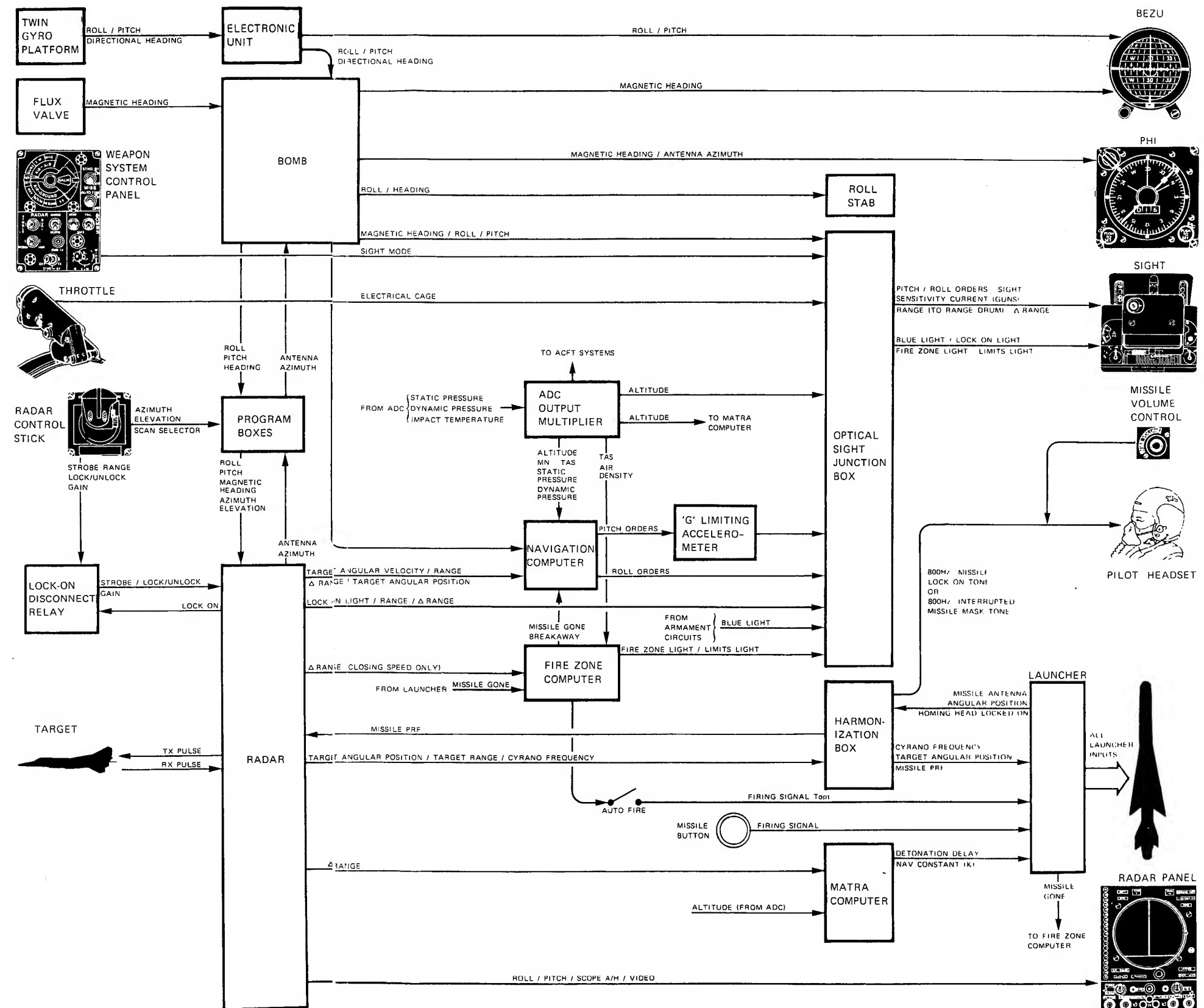
**Weapon System Air-to-Air Fire Control**

Figure FO 1-1

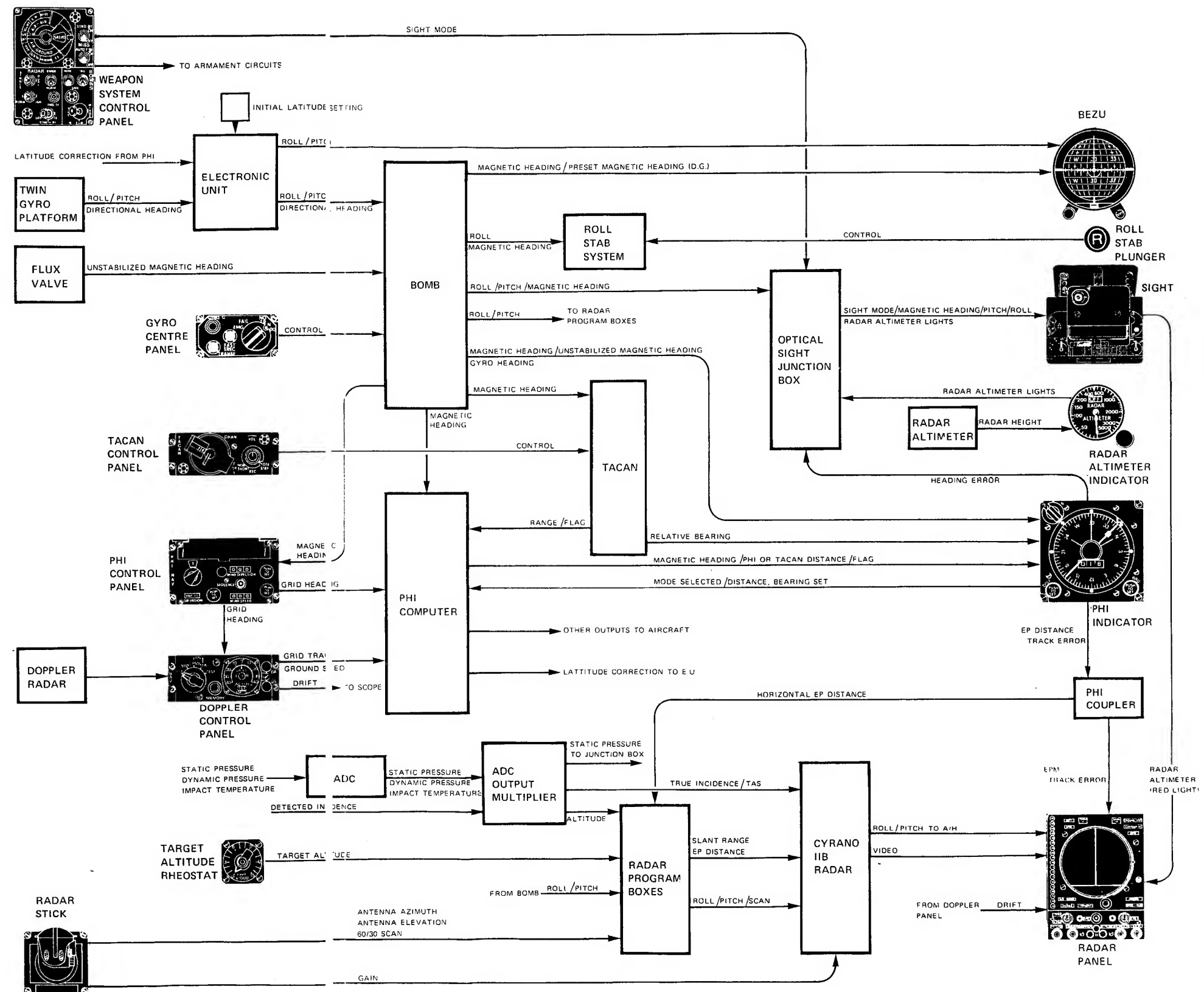
**Weapon System Navigation — Typical**

Figure FO 1-2

# Typical Intercept with Matra R530EM Missile

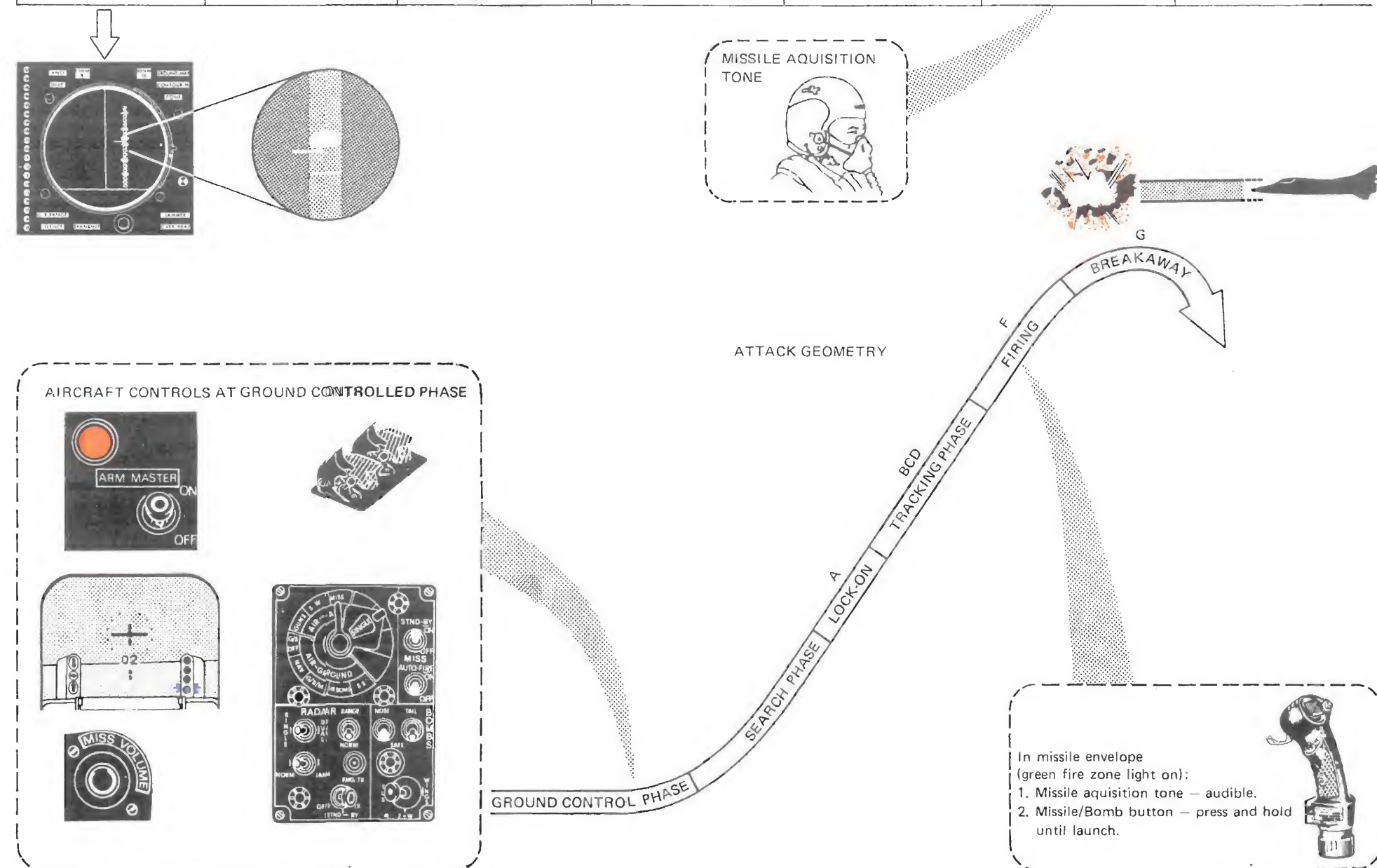
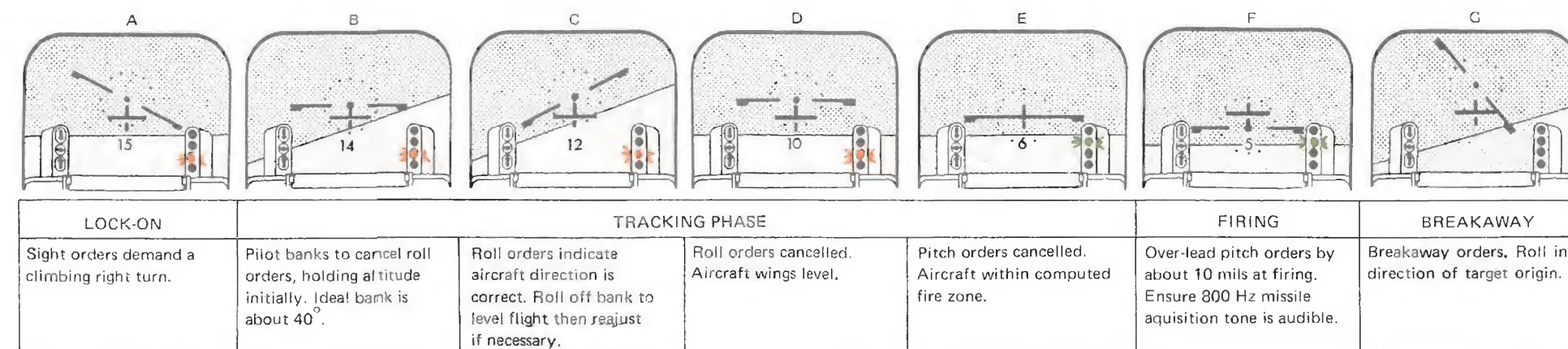


Figure FO 1-3



## Typical Matra R550 Attack

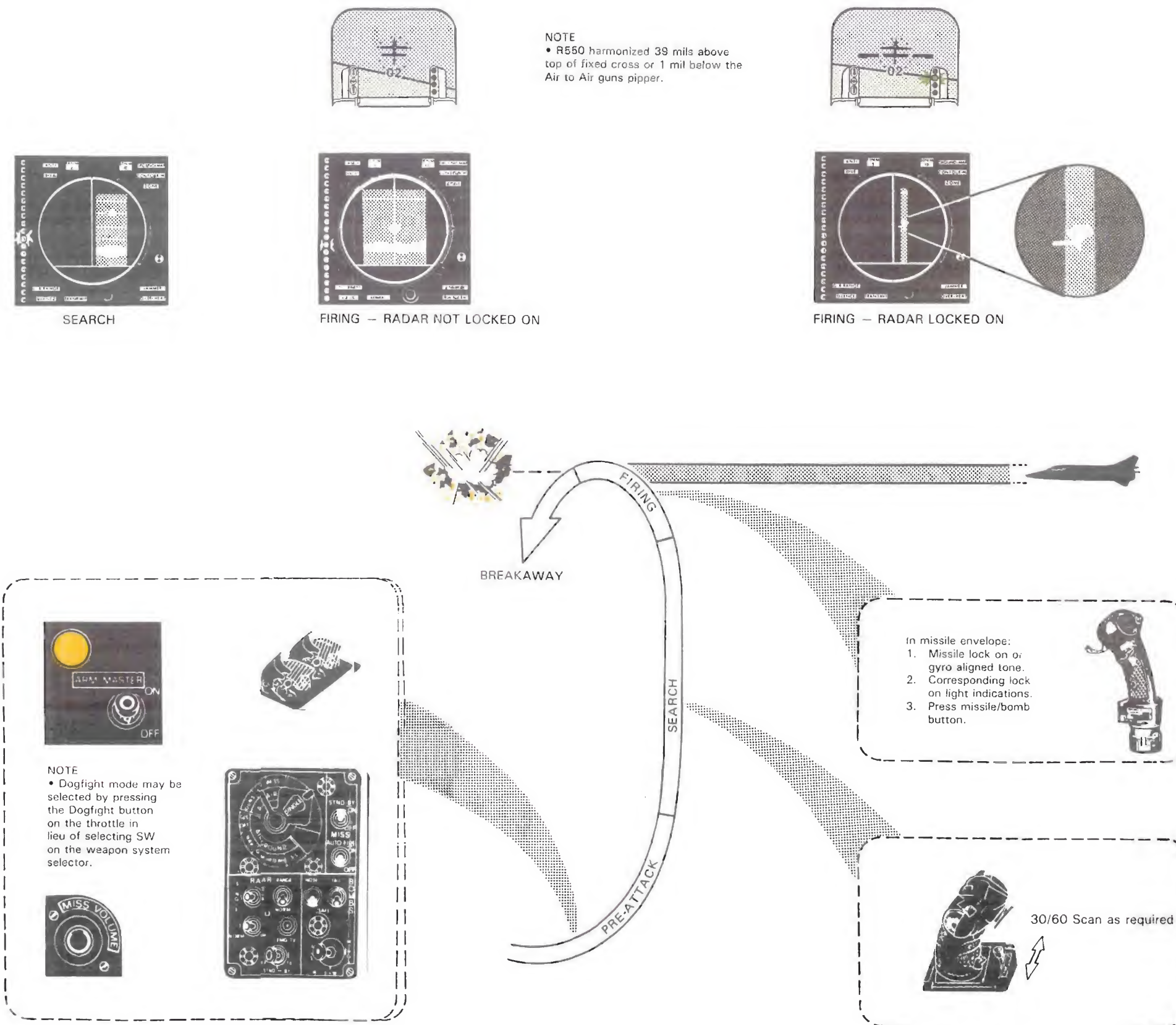
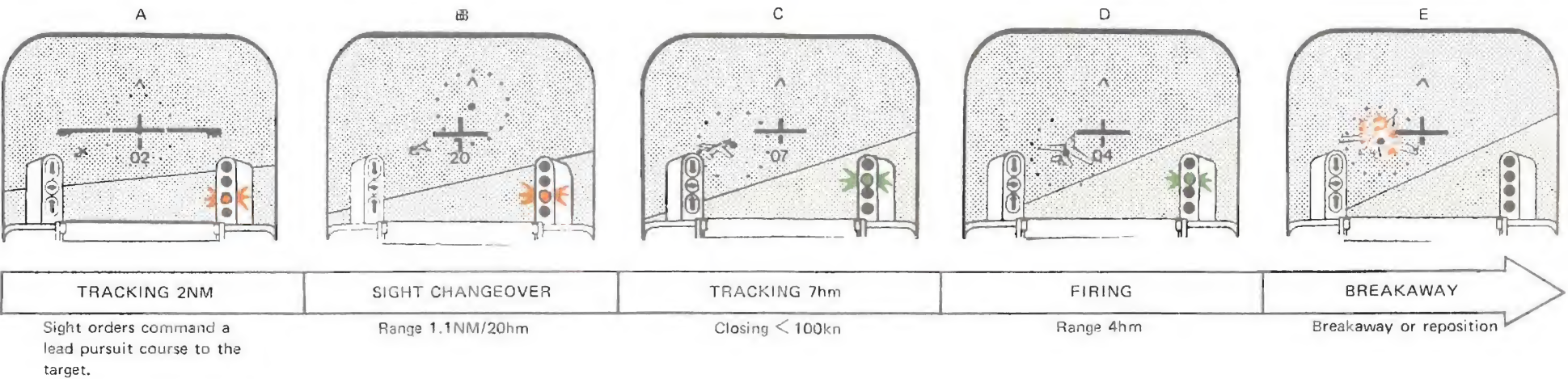


Figure FO 1-4

Tracking Phase with Guns – Air-to-Air



Note  
When sidewinders are carried the weapon system selector may be left in S.W. and GUNS AIR-AIR and AIR-AIR RANGE selected using the sight override button.

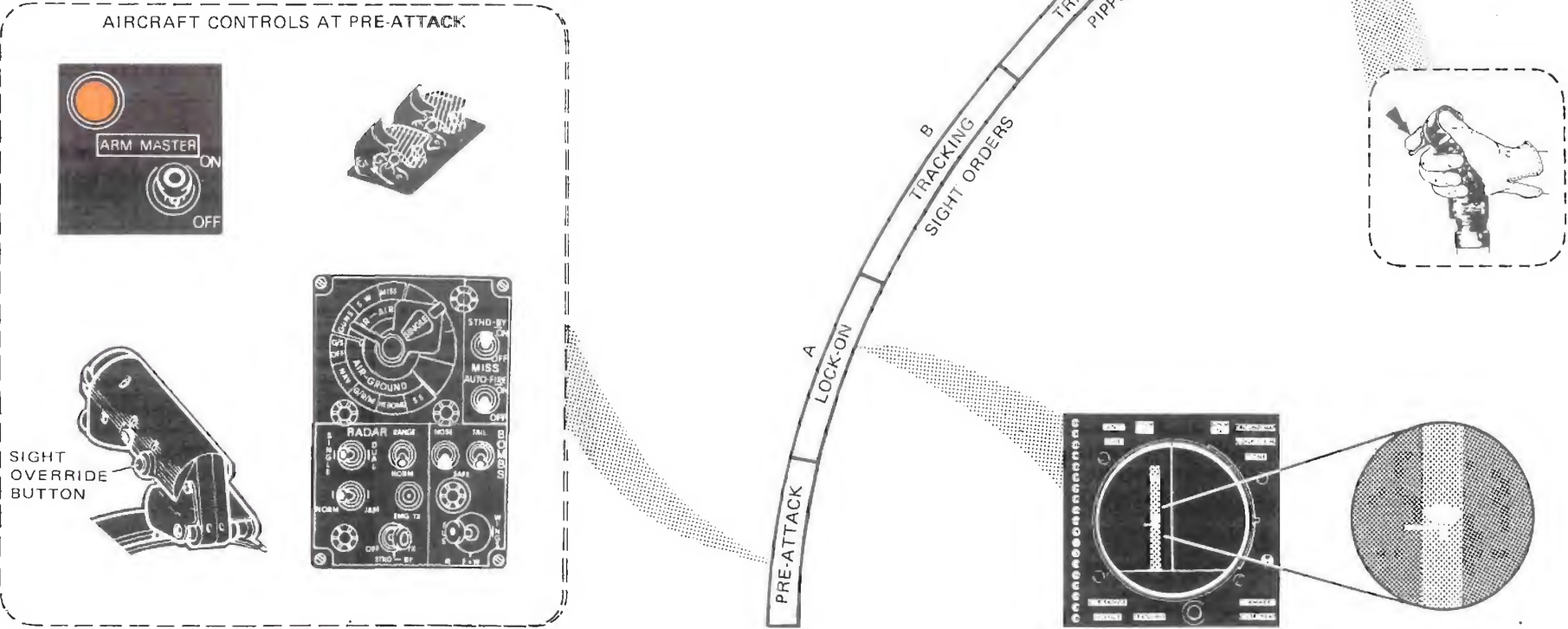


Figure FO 1-5



**SECTION 2**  
**NORMAL PROCEDURES**



## SECTION 2

## NORMAL PROCEDURES

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Post - Release Checks

1. ARM MASTER switch - OFF.
2. BOMBS switch - OFF (guard down).
3. Bomb Fuzing Switches - SAFE.
4. Trigger - Safe.

LANDING WITH UNEXPENDED  
KARINGA CBU AND BTV-3 STORES

Landing with unexpended Karinga CBU and BTV-3 stores is permitted provided:

- a. No bomb release attempt has been made; and
- b. the destination airfield has the required ground personnel, equipment and safety points.

**Note**

If bomb release was attempted but failed, ie the bombs are 'hung up', landing is not permitted unless the subsequent jettison attempt has failed, refer to 'LANDING WITH HUNG BOMBS' at section 3 for MK 82 bombs.

After Landing

1. Hold at the designated aircraft safety point (ASP).
2. Raise hands - Armourer disconnects the bomb initiator leads.
3. When cleared by armourer - Taxi to OLA.

Date: FEB81

12. Bomb nose cover - Secure.
13. Initiator - No red showing (loaded indication).
14. Initiator access panel - Secure.
15. Bombs - Firmly crutched.
16. Tail support crutch - Secure against bomb tail.
17. Nose and retarder safety clamps - Armourer to remove.

#### If Only One Bomb is Carried

18. Bomb hooks rear station - Fully open.

#### After-Start Checks

1. Perform after-start check as for other aircraft stores.

#### Pre-Release Checks

1. Weapon system selector - Desired AIR-GROUND mode.
2. Sight depression rheostat - Set.
3. Bomb Fuzing Switches - OFF (Safe), NOSE (Primary arm mode) or NOSE and TAIL (Option arm mode).
4. Bomb station selector - FUS.
5. SINGLE/SALVO switch - As required.
6. BOMBS switch - ON.
7. ARM MASTER switch - ON (amber light on).

#### Release

1. Missile/bomb button - Press and hold.

#### **Note**

For multiple releases, the time delay of 0.3 seconds between bombs must be considered and the pilot must hold the missile/bomb button pressed until all bombs are released.



RAAF SUPPLEMENT NO 7NORMAL PROCEDURES - KARINGA CBU AND BTV-3 STORES ON PM-3Instructions

This supplement is to be inserted facing page 2-1.

Action

The following is to be read in conjunction with Section 2 Normal Procedures:

KARINGA CBU AND BTV-3 STORES ON PM-3Cockpit Checks

1. ARM Master Switch - OFF.
2. BOMBS Switch - OFF (guard down).
3. Nose and tail fuzing switches - SAFE.
4. Trigger - SAFE.
5. ☐ Bomb Fuzing Switch - SAFE

Pre-Flight Checks

1. Front gas regulator port - OPEN.
2. Rear gas regulator port - SMALL INLET.
3. Ratchet - In contact (through inspection hole at each station).
4. Nose arming wires safety clamp - Installed.
5. Retarder arming wire safety clamp - Installed.
6. Option fuze time (CBU only) - Set to mission requirements.
7. ARM fuzing loop - Positively retained in FWD arming unit.
8. FUZE lanyard - Connected to forward hardpoint.
9. OPTION fuzing loop - Positively retained in AFT arming unit.
10. RETARDER lanyard - Connected to AFT hardpoint.
11. Arming wires - correctly routed.

## SECTION 2

### NORMAL PROCEDURES

This section contains pre-flight, in-flight and post-flight procedures for all weapons employed on the aircraft. Checks are included for landing with unfired missiles or bombs. This applies to weapons where no firing attempts have been made. For landing with hung missiles or bombs refer to Section 3.

#### WARNING

- During training missions, the ARM MASTER switch is not to be selected ON until cleared and on the attack heading.
- To avoid injury to ground personnel, turn the radar master switch to STND-BY or OFF before approaching the aircraft safety point for final arming or de-arming.

#### MATRA

##### COCKPIT CHECKS

Before pre-flight the following switches in the cockpit must be checked :

1. ARM MASTER switch—OFF.
2. MISSILES switch—OFF (guard down).
3. MISS STND-BY switch—OFF.
4. AUTO-FIRE switch—OFF.
5. Trigger—Safe.

##### PRE-FLIGHT CHECKS

Check a live missile (yellow band) or a training missile (blue band) as follows :

1. Launcher safety (EJECTOR) plug—FLIGHT (refer to Fig 2-1).
2. Electromagnetic lock plunger—Down.
3. Shear pin—In place.
4. Launcher lock-pin—In place.

#### Launcher Safety Plug

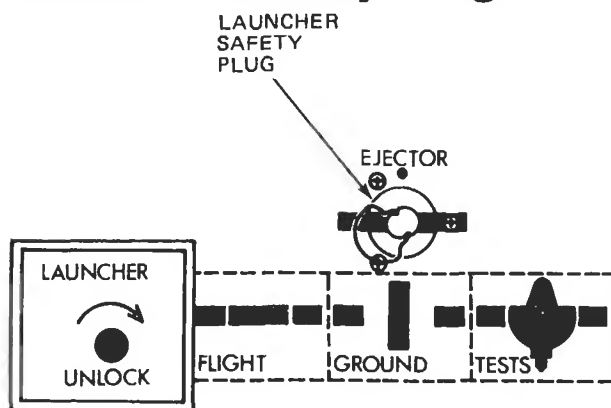


Figure 2-1

#### If Live Missile :

5. Warhead SAFETY PLUG—Armed (flush) (refer to Fig 2-2).
6. Wings and fins—Condition.
7. Rocket motor nozzle—Attached (refer to Fig 2-3).
8. Leads—3 connected and 2 hanging at rear of missile (refer to Fig 2-3).

#### Warhead Safety Plug



Figure 2-2

#### Rocket Motor Nozzle

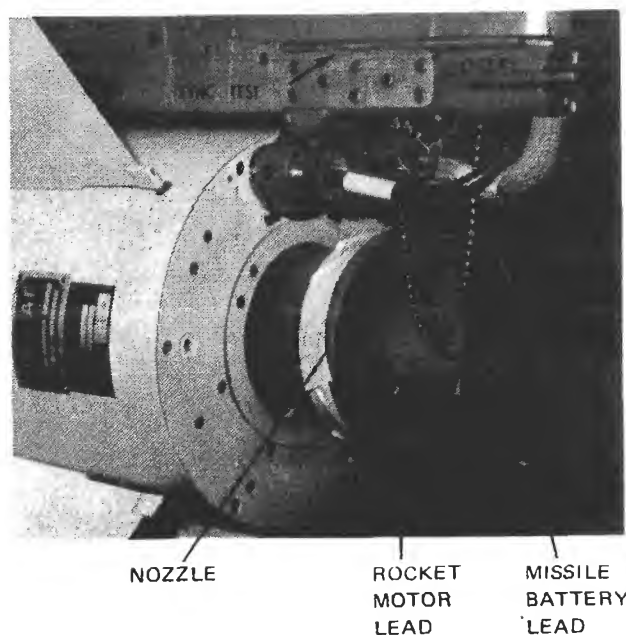


Figure 2-3

### If Training Missile :

9. Wings and fins—Condition.
10. Leads—Four connected.

### BEFORE START CHECKS

Carry out gunsight and gun camera checks as detailed in DI(AF) AAP 7213.003-1.

### AFTER START CHECKS

At the designated ACFT safety point :

1. Hold with ACFT in safe direction.
2. Raise hands—Armourer :
  - a. Performs no voltage check.
  - b. Plugs in rocket motor and battery leads.
3. Radar master switch—STND-BY or TX.
4. MISS STND-BY switch—ON.

### PRE-FIRING CHECKS

1. Weapons system selector—MISS.
2. MISS STND-BY switch—ON.

#### Note

- The missile battery must be adequately pre-heated before firing (refer to Sect 1, MATRA R530K).
  - The MISS STND-BY switch must be ON for three minutes prior to firing to ensure correct proximity fuse operation.
  - For the training missile, the MISS STND-BY switch must be ON two minutes prior to radar lock-on.
3. MISSILES switch—On.
  4. Anti-jam switch—As required.
  5. AUTO-FIRE switch—As required.
  6. ARM MASTER switch—ON (amber light on).
  7. Blue sequence light—On.

### FIRING CHECKS

1. Acquisition tone—Audible (not masking tone).
2. Sight orders—Cancelled, wings level if possible and pitch orders led by 10-15 mils.

#### Either :

3. Missile/bomb button—Press and hold until missile launch.

#### Or :

4. Automatic firing at Topt if AUTO-FIRE switch is ON.

### AFTER FIRING CHECKS

1. ARM MASTER switch—OFF (amber light off).
2. MISSILES switch—OFF (guard down).
3. AUTO-FIRE switch—OFF.
4. Trigger—Safe.

#### Note

After a simulated firing of the Matra R530KE training missile, the MISS STND-BY switch should be momentarily selected OFF to reset the electro-magnetic lock and to regain normal radar scan.

### AFTER LANDING CHECKS

After landing with an unfired Matra R530K, at the designated aircraft safety point :

1. Hold with ACFT in safe direction.
2. Raise hands—Armourer unplugs battery and rocket motor leads.
3. When cleared—Taxi to OLA.

#### Note

The MISS STND-BY switch is to be left ON until just prior to aircraft shutdown.

### MATRA R550

### COCKPIT CHECKS

Before pre-flight, the following switches in the cockpit must be checked:

1. ARM MASTER switch — OFF.
2. MISSILE switch — OFF.
3. Trigger — Safe.

### PRE-FLIGHT CHECKS — OPERATIONAL R550

1. Launcher safety lever — Raised and safety pin installed.
2. 'Ground Safety' pip-pin — Installed.
3. Security on launcher — Correct.
4. Protective cover — Removed from seeker head.
5. IR dome — Clean.
6. Proximity fuse cover — Removed.
7. Launcher nose cover — Closed and locked.
8. Launcher rear cover — Closed and locked.
9. Wings and fins — Secure.

### PRE-FLIGHT CHECKS — TRAINING VERSION

Pre-flight checks for the training R550 missile are identical to those of the operational missile with the exception of Nos 1, 2 and 6. The Launcher Safety Lever pin and 'Ground Safety' pip-pin are removed from the missiles before the pilot arrives at the aircraft. There are no proximity fuse windows on the training missiles.

### PRE-FLIGHT CHECKS — INERT BALANCING VERSION

1. Security on launcher — Correct.
2. Launcher nose fairing — Closed and locked.
3. Launcher rear fairing — Closed and locked.
4. Missile wings — Secure.

#### Note

For R550 training and inert balancing missiles, check that the missile is secure on the launcher and that the front and rear fairings are closed and locked.

### BEFORE START CHECKS

#### WARNING

The following checks may only be performed before engine start if both DC and AC external power are provided to the aircraft. DO NOT select MISS STND-BY to ON with DC only power (battery).

**Note**

If DC only power is available to the aircraft, perform the following checks after engine start.

1. Trigger — Safe.
2. Weapon system selector — Any function except S.W. or OFF.
3. MISS STND-BY switch — ON. The seeker head requires a 34 second run-up period.
4. SINGLE/SALVO switch — SINGLE to check left missile/SALVO to check right missile.
5. Dogfight mode — Select.
  - a. Dogfight light illuminated.
  - b. AIR-AIR GUNS information displayed in the gunsight.
6. MISS VOLUME rheostat — As required.
7. D TACAN/S.W. monitor switch — S.W.

While the airman provides an IR source to the selected missile, check:

8. Missile tone — Continuous.
9. Missile Lock-on light — Illuminated and steady. The gyro-alignment process takes up to 0.7 second. A flashing lock-on light and chopped tone may be observed briefly before the lock-on indication.
10. Boresight button — Press.
  - a. Lock-on light extinguishes and tone stops.
  - b. After approximately 0.3 second the missile re-locks onto the IR source.
11. Boresight button — Release. Missile remains locked on.

If two operational or training missiles are carried:

12. Dogfight light — Press.
13. SINGLE/SALVO switch — Reverse selection.
14. Dogfight mode — Select.

The deselected missile should lock on to the IR source. Repeat checks 7 to 9 while the airman provides an IR source to the second missile.

15. Weapon system selector — S.W.
  - a. Missile breaks lock, then locks on to the selected missile.
  - b. S.W. information displayed in gunsight.
16. Weapon system selector — As required for the mission.
17. MISS STND-BY switch — OFF.

**Note**

If the only external power source available prior to engine start is DC, leave the MISS STND-BY switch off until the alternator and generator are on line after start, and then perform the R550 pre-start checks.

**AFTER START CHECKS**

At the designated ACFT safety point:

1. Hold with ACFT pointed in a safe direction.
2. Raise hands — Armourer:
  - a. Removes 'Ground Safety' pip-pin; and
  - b. Removes 'Ground/Flight' safety pin.

**PRE-FIRING CHECKS**

1. MISS STND-BY switch — ON.
2. Weapon system selector — S.W. or Dogfight with the weapon system selector.
3. SINGLE/SALVO switch — SINGLE or SALVO.
4. MISSILE switch — ON.
5. ARM MASTER switch — ON (amber light on).
6. MISS VOLUME rheostat — As required.

**Note**

The purple sequence light is illuminated when the above switches are made.

**FIRING CHECKS**

1. Missile tone — Continuous with target discriminated.
2. Missile locked-on light — Continuously illuminated.

**Note**

In practice, the pilot may operate the launch button as soon as the homing head (HHL) signal appears, but the missile is ignited only after gyro alignment.

3. Missile/Bomb button — Press and hold until missile launch.

**AFTER FIRING CHECKS**

1. ARM MASTER switch — OFF.
2. MISSILE switch — OFF (guard down).
3. Trigger — Safe.
4. MISS STND-BY switch — OFF.

**AFTER LANDING CHECKS**

**Note**

The MISS STND-BY switch must be selected OFF before engine shut-down to prevent damage to loaded operational or training missiles.

After landing with unfired R550 missiles, perform the following operations at the designated aircraft safety point:

1. Ensure switches are selected OFF or SAFE.
2. Hold with ACFT pointed in a safe direction.
3. Raise hands — Armourer installs the launcher 'Ground/Flight' safety and 'Ground Safety' pins.
4. When cleared by armourer — Taxi to OLA.

**TDU-11/B TARGET ROCKET**

**COCKPIT CHECKS**

Before pre-flight the following switches in the cockpit must be checked :

1. ARM MASTER switch — OFF.
2. MISSILES switch — Off (guard down).
3. Trigger — Safe.

**PRE-FLIGHT CHECKS**

1. If carried with S.W., fitted to left wing only.
2. Security on launcher — Correct.



3. Transfer plug—Installed in launcher umbilical cable connector.
4. Launcher nose cover—Closed and locked.
5. Flares—Secure.
6. Pigtail—Not plugged in (shorting clip attached).
7. Detent locking pin—Installed.

**AFTER START CHECKS**

At the designated ACFT safety point:

1. Hold with ACFT pointed in safe direction.
2. Raise hands — Armourer:
  - a. Performs no voltage check, and
  - b. Removes shorting clip and plugs in pigtail.

**Note**

The launcher safety pin is not used with the target rocket.

**PRE-FIRING CHECKS**

1. MISS STND-BY switch—ON.
2. Weapon system selector—S.W.
3. SINGLE/SALVO switch—SINGLE (left launcher).
4. MISSILES switch—On.
5. ARM MASTER switch—ON (amber light on).

**If Also Firing S.W. :**

6. MISS VOLUME rheostat—As required (check S.W. tone on SALVO).

**FIRING CHECKS**

1. Missile/bomb button—Press and hold until missile launch.

**If Also Firing S.W. :**

2. SINGLE/SALVO switch—SALVO.
3. Missile tone—Audible and target discriminated.
4. Missile/Bomb button—Press and hold until S.W. launch.

**Note**

Firing a target rocket from the left launcher does not activate the launcher changeover relay. To subsequently fire either a second target rocket or a S.W. from the right launcher the SINGLE/SALVO switch must be selected to SALVO.

**AFTER FIRING CHECKS**

1. ARM MASTER switch—OFF.
2. MISSILES switch—Off (guard down).
3. Trigger—Safe.

**AFTER LANDING CHECKS**

After landing with unfired target rockets, at the designated ACFT safety point :

1. Hold with ACFT in a safe direction.
2. Raise hands—Armourer removes pigtail and replaces shorting clip.
3. When cleared—Taxi to OLA.

**GUNS**

Gunnery checks are the same for HE and ball ammunition.

**COCKPIT CHECKS**

Before walk-around the following cockpit switches must be checked :

1. ARM MASTER switch—OFF.
2. GUNS switch—Off (guard down).
3. Trigger—Safe.

**PRE-FLIGHT CHECKS**

1. Gunpack safety pin—Installed (refer to Fig 2-5).
2. Gun cover panels—Secure.

**BEFORE START CHECKS**

Carry out gunsight and gun camera checks as detailed in DI(AF) AAP 7213.003-1.

**AFTER START CHECKS**

At the designated QLA and following Pitch Damper Operational Checks:

1. Hold with ACFT in safe direction.
2. Raise hands—Armourer removes Gunpack Safety Pin.

**PRE-FIRING CHECKS**

1. Weapons system selector—As required.
2. GUNS switch—On.
3. ARM MASTER switch—ON (amber light on).

**FIRING CHECK**

1. Trigger—Squeeze (second pressure).

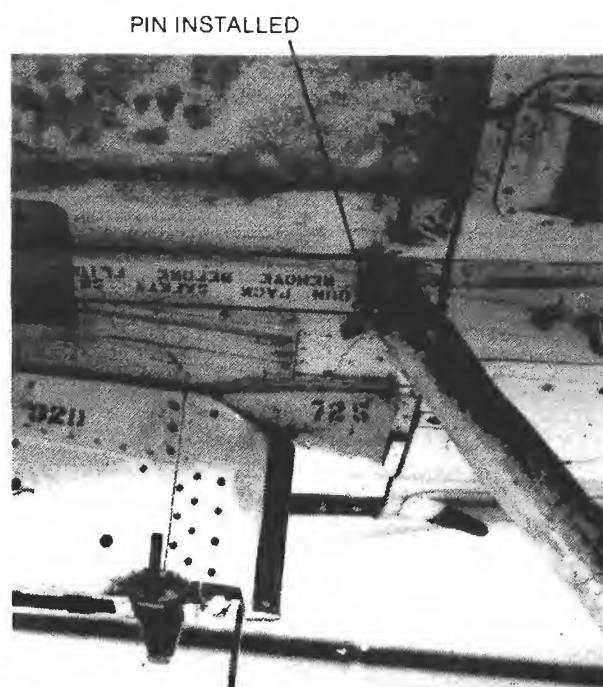
**Gunpack Safety Pin**

Figure 2-5

**AFTER FIRING CHECKS**

1. ARM MASTER switch—OFF (amber light out).
2. GUNS switch—Off (guard down).
3. Trigger—Safe.

**AFTER LANDING CHECKS**

At the designated QLA and before tyre check:

1. Hold with ACFT in safe direction.
2. Raise hands—Armourer installs Gunpack Safety Pin.

**MK82 CONICAL FIN ON PM-3****COCKPIT CHECKS**

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Nose and tail fusing switches—SAFE.
4. Trigger—Safe.
5. ☒ Bomb fusing switch—SAFE.



## Alkan 257-2E Release Unit (PM-3)

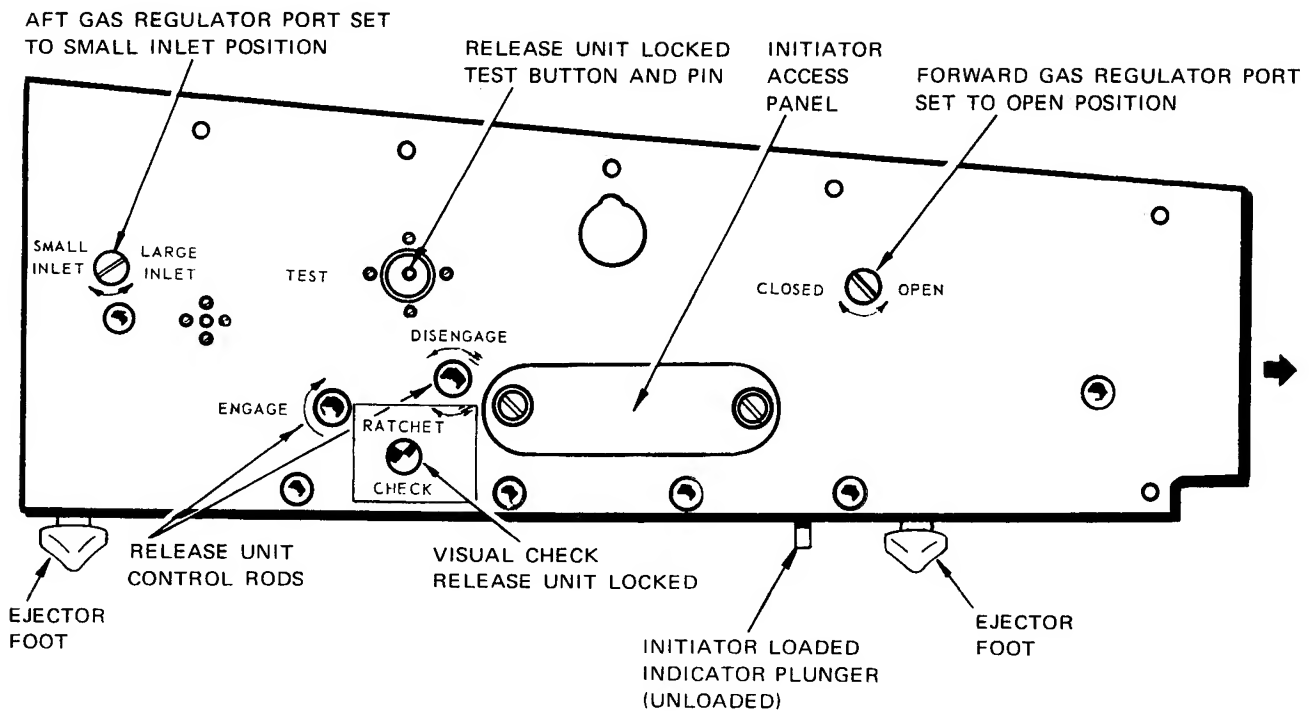


Figure 2-6

### PRE-FLIGHT CHECKS

1. Front gas regulator port—OPEN.
2. Rear gas regulator port—SMALL INLET.
3. RATCHET CHECK—In contact (peep hole at each station).  
The location of the gas regulator ports and the ratchet peep hole are shown in Figure 2-6.
4. Arming loops—Positively retained in arming solenoids.
5. Initiator (PM-3)—No red showing (loaded indication).
6. Nose fuse arming delay—As required.
7. Nose fuse windows—No red showing (refer to Fig 2-7).
8. Initiator access panel (PM-3)—Secure.
9. Bombs—Firmly crutched.
10. Tail support crutch—Against bomb tail.
11. Arming wires—Correctly routed, engaged in nose and tail arming vanes (refer to Fig 2-8).
12. Nose and tail fuse safety pins (refer to Fig 2-7 and 2-9)—Armourer removes.

#### Note

Arming wires engaged in the nose and tail arming vanes prevent rotation.

#### If Only One Bomb is Carried :

13. Bomb hooks rear station—Fully open.

## M904 Nose Fuse

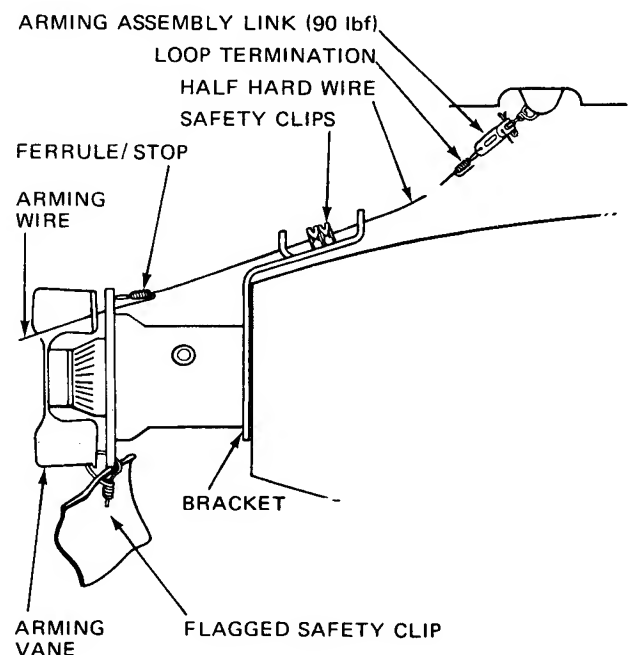


Figure 2-7

## Routeing of Arming Lanyards — Low Drag Bomb on PM-3

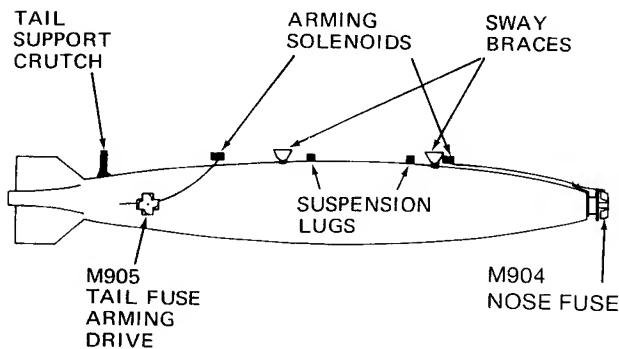


Figure 2-8

## M905 Tail Fuse Arming Drive

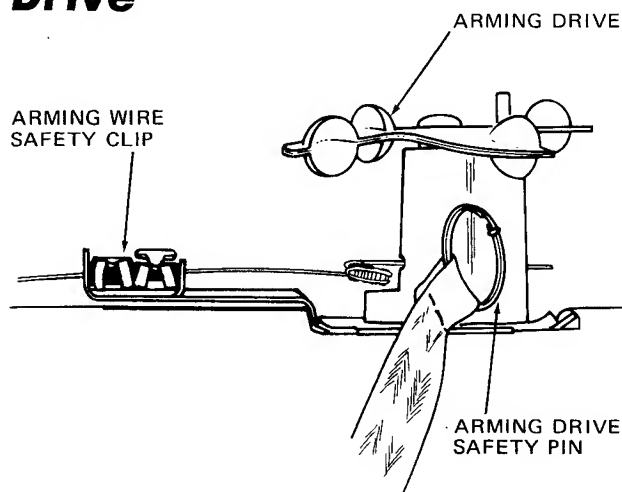


Figure 2-9

### AFTER START CHECKS

Perform after start checks for other armament.

### PRE-RELEASE CHECKS

1. Weapon system selector—Desired AIR-GROUND mode.
2. Sight depression rheostat—Set.
3. Bomb fusing switches—As required.
4. Bomb station selector—FUS.
5. SINGLE/SALVO switch—As required.
6. BOMBS switch—On.
7. ARM MASTER switch—ON (amber light on).

### RELEASE

1. Missile/bomb button—Press and hold.  
For multiple releases, the time delay between bombs must be considered and the pilot must hold the missile/bomb button pressed until all bombs release.

### POST RELEASE

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Bomb fusing switches—SAFE.
4. Trigger—Safe.

## MK82 SNAKEYE ON PM-3

### COCKPIT CHECKS

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Nose and tail fusing switches—SAFE.
4. Trigger—Safe.
5. ☒ Bomb fusing switch—SAFE.

### PRE-FLIGHT CHECKS

1. Front gas regulator port—OPEN.
2. Rear gas regulator port—SMALL INLET.
3. RATCHET CHECK—In contact (peep hole at each station).
4. Arming loops—Positively retained in arming solenoids.
5. Initiator (PM-3)—No red showing (loaded indication).
6. Nose fuse—Check :
  - a. Not fitted for peacetime operations.
  - b. Arming delay—As required.
  - c. Fuse windows—No red showing.
  - d. Safety pin—Armourer removes.
7. Initiator access panel (PM-3)—Secure.
8. Bombs—Firmly crutched.
9. Tail support crutch—Not against bomb tail.
10. Fin retaining safety pin—Armourer removes.
11. FMU-54/B fuse arming lanyard (thinner cable)—Routed from rear centre-well hole through the centre-well link under the rear ejector foot then directly to the arming solenoid (refer to Fig 2-10).

### Note

The fuse arming lanyard must pass through the centre-well link or the bomb tail will not open.

12. Tail opening lanyard—Looped through rear bomb lug and connected to centre-well link and tail arming pin.
13. Tail arming pin—Retained by safety clip.
14. All wires—Routed under rear ejector foot.

### If Only One Bomb is Carried :

15. Bomb hooks rear station—Fully open.

RAAF SUPPLEMENT NO 31POST RELEASE CHECKSInstructions

This supplement is to be inserted facing Page 2-6.

Information

An aircraft recently landed with a hung bomb. The pilot was unaware that there was a bomb still attached to the aircraft.

Action

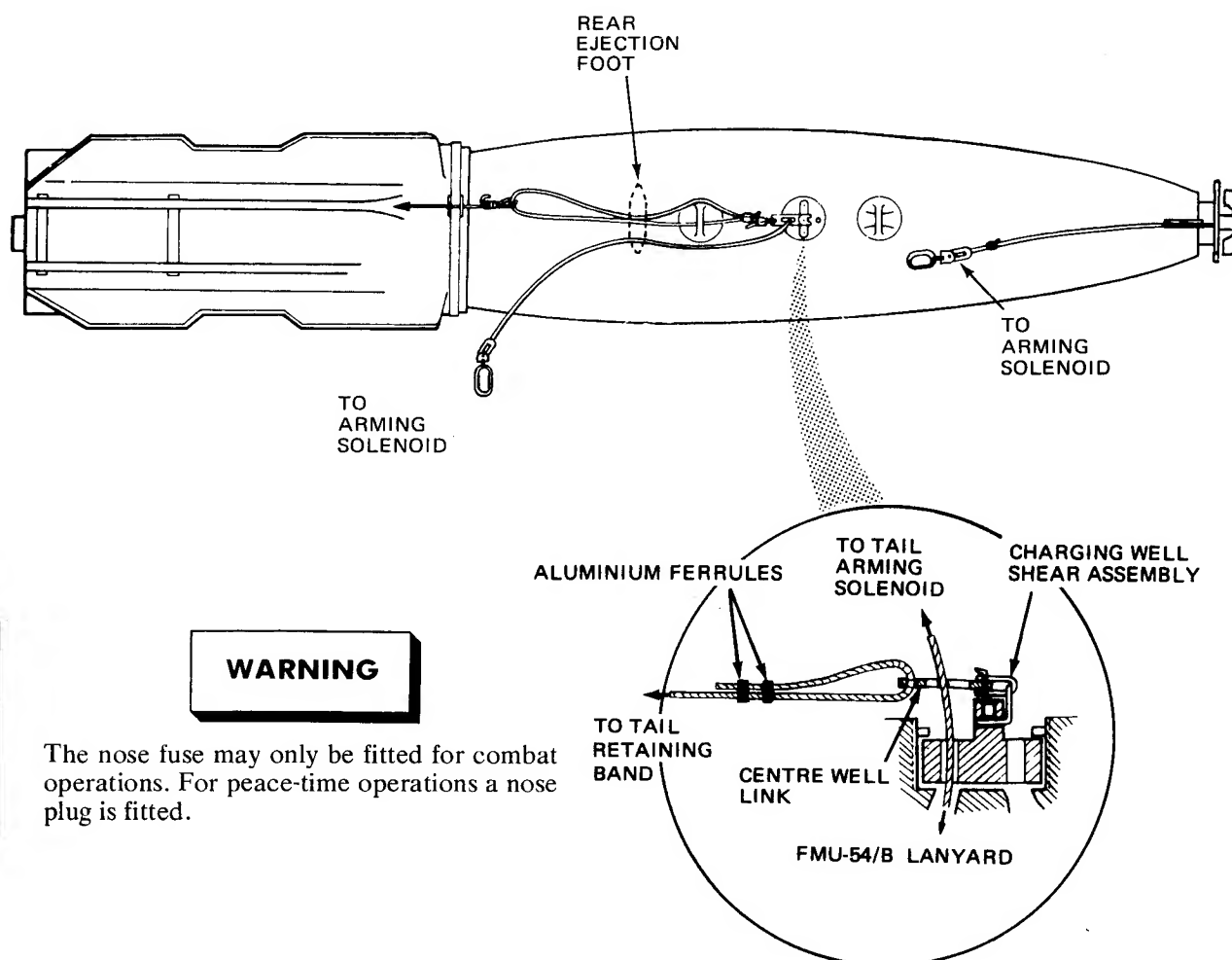
An airborne inspection is to be carried out, during daylight hours, if practical.

**CAUTION**

During daylight operations, if an airborne inspection is deemed impractical, pilots should obtain a flypast inspection from the control tower. At night, lateral trim changes may be the only indication of a hung bomb on the RPK-10. However, a hung bomb on the PM-3 will be almost impossible to detect.

Date: MAR85

## Routeing of Arming Lanyards — High Drag Bomb on PM-3



### WARNING

The nose fuse may only be fitted for combat operations. For peace-time operations a nose plug is fitted.

Figure 2-10

### AFTER START CHECKS

Perform after start checks for other armament.

### PRE-RELEASE HIGH DRAG DELIVERY

1. Weapon system selector—Desired AIR-GROUND mode.
2. Sight depression rheostat—Set.
3. Nose fusing switch—SAFE.

If the nose fusing switch is inadvertently selected to NOSE for a high drag delivery and the tail fails to open, the bomb may detonate while the ACFT is within the bomb fragmentation envelope.

### WARNING

Do not select the nose fusing switch to NOSE for high drag deliveries.

4. Tail fusing switch—TAIL.
5. Bomb station selector—FUS.
6. SINGLE/SALVO switch—As required.

7. BOMBS switch—On.

8. ARM MASTER switch—On (amber light on).

### PRE-RELEASE LOW DRAG DELIVERY

1. Weapon system selector—Desired AIR-GROUND mode.
2. Sight depression rheostat—Set.
3. Nose fusing switch—NOSE.
4. Tail fusing switch—SAFE.
5. Bomb station selector—FUS.
6. SINGLE/SALVO switch—As required.
7. BOMBS switch—On.
8. ARM MASTER switch—ON (amber light on).

### RELEASE

1. Missile/bomb button—Press and hold.  
For multiple releases, the time delay between bombs must be considered and the pilot must hold the missile/bomb button pressed until all bombs release.

#### POST RELEASE

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Bomb fusing switches—SAFE.
4. Trigger—Safe.

### GBU-12C/B LASER GUIDED BOMB ON PM-3

#### COCKPIT CHECKS

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Nose and tail fusing switches—SAFE.
4. Trigger—Safe.
5. ☐ Bomb fusing switch—SAFE.

#### PRE-FLIGHT CHECKS

1. Bomb—Firmly crutched.
2. Initiator access panel—Secure.
3. Front gas regulator port—OPEN.
4. Rear gas regulator port—SMALL INLET.
5. RATCHET CHECK—In contact (peep hole).
6. Arming lanyards—Correctly positioned in fusing units.
7. Tail support crutch—Not against bomb tail.
8. Detector cover and packing—Removed.
9. Detector housing/ringtail—Undamaged.
10. Seeker detector window—Clean.
11. Seeker head—Gimbals free.
12. Computer code—Corresponds to mission requirements.
13. Test connector cover—Installed.
14. Thermal battery safety wire flag—Removed.
15. Thermal battery lanyard—Installed (lanyard attached to front left sway brace of PM-3).
16. Canards—Slight movement.
17. Fusing details—Written on side of bomb.

18. Charging well safety pin—Removed.
19. Tail latch lanyard—Installed (lanyard attached to rear left sway brace of PM-3).
20. Tail latch assembly safety pin—Removed.

#### WARNING

Fins deploy quickly. Avoid contact with tail latch assembly.

21. Tail latch assembly wing safety pin—Removed.
22. Tail fuse arming wire—Installed (if applicable).

#### AFTER START CHECKS

Perform after start checks for other armament.

#### PRE-RELEASE CHECKS

1. Weapon system selector—Desired AIR-GROUND mode.
2. Sight depression rheostat—Set.
3. Bomb fusing switches—As required.
4. Bomb station selector—FUS.
5. SINGLE/SALVO switch—As required.
6. BOMBS switch—On.
7. ARM MASTER switch—ON (amber light on).

#### RELEASE

1. Missile/bomb—Press and hold.

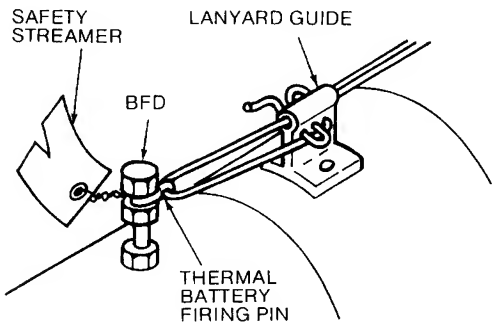
For multiple releases, the time delay between bombs must be considered and the pilot must hold the missile/bomb button pressed until all bombs release.

#### POST RELEASE

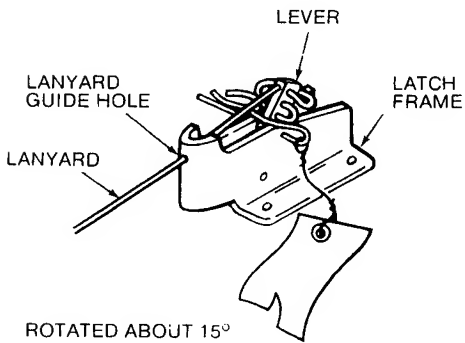
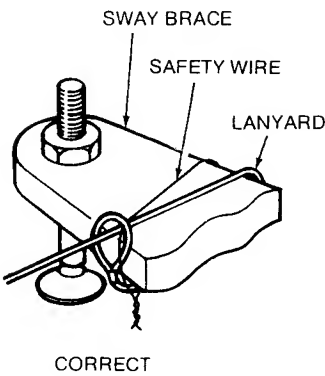
1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Bomb fusing switches—SAFE.
4. Trigger—Safe.



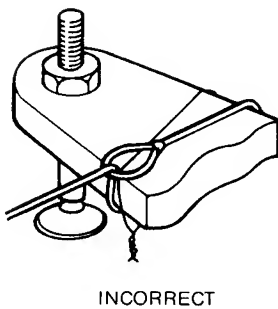
# Routeing of Arming Lanyards - KMU388 C/B Guidance Kit



**THERMAL BATTERY ARMING LANYARD**



**FOLD-OUT WING ARMING LANYARD**



**PM-3 LANYARD ROUTEING**

**Figure 2-10A**

## ALKAN Type 101 Release Unit (RPK 10)

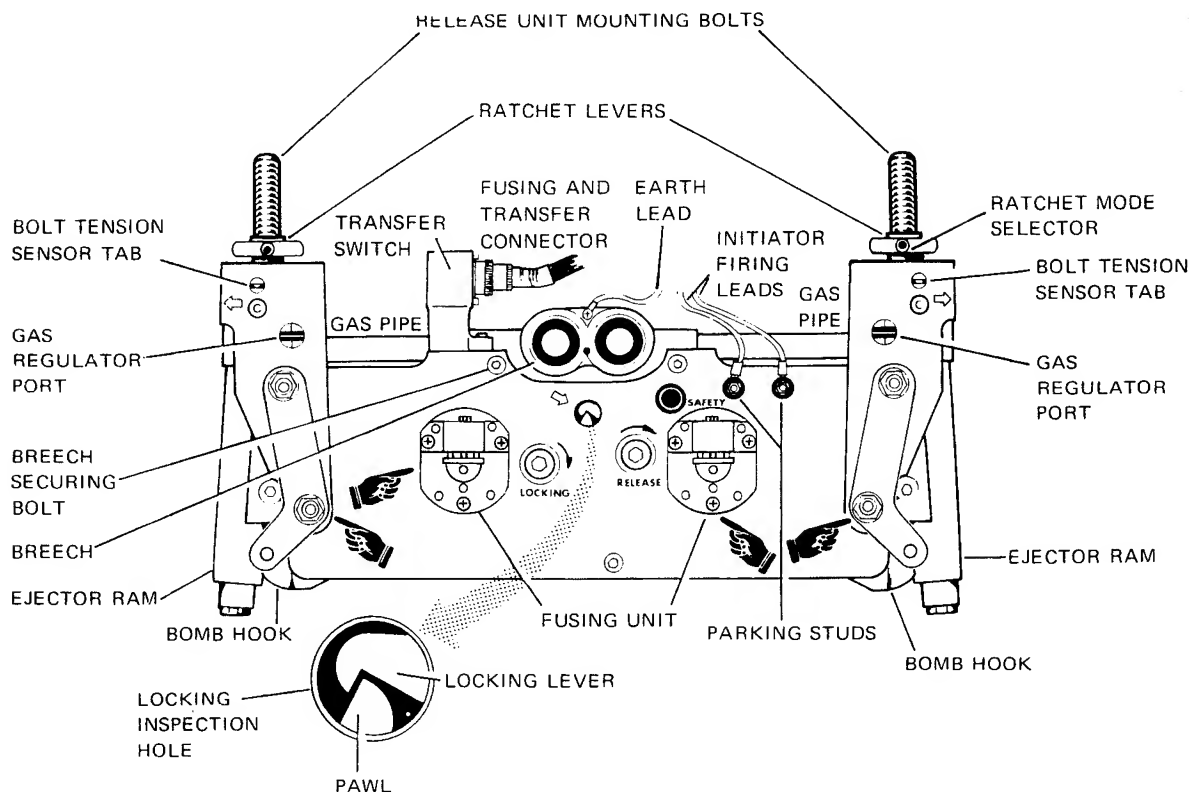


Figure 2-11

### MK82 CONICAL FIN ON RPK10

#### COCKPIT CHECKS

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Nose and tail fusing switches—SAFE.
4. Trigger—Safe.
5. ☒ Bomb fusing switch—SAFE.

#### PRE-FLIGHT UNLOADED STATIONS

1. Transfer connector leads—Connected (refer to Fig 2-11).
  2. Initiator leads—Connected to parking studs.
  3. Bomb hooks—Open.
  4. Inspection cover—Closed and secure.
- Ejector rams may be extended.

#### PRE-FLIGHT LOADED STATIONS

1. Inspection cover—Open.
2. Release unit safety pins—Fitted to each unit (refer to Fig 2-11).
3. Bomb—Securely crutched (bolt tension sensor tabs immovable).

4. Ejector port settings—All except inboard rear 7.0 mm.  
—Inboard rear 1.2 mm.

#### Note

- At an ejector port setting of 7.0 mm, the thick red index line is horizontal.
  - Carriage of bombs on the inboard rear stations is not currently cleared.
5. Arming link assemblies—Positively engaged in arming solenoids.
  6. Nose fuse arming delay—As required.
  7. Fuse vane safety pins—Armourer removes.
  8. Nose fuse arming wire—Direct run from front solenoid under Y-shaped sway brace to nose fuse.
  9. M905 tail fuse arming wire—Direct run from arming drive under Y-shaped sway brace to rear solenoid (refer to Fig 2-12).

#### Note

Ensure arming wires are routed outside the bomb lugs and are not crushed by bomb sway braces.

## Routeing of Arming Lanyards — Low Drag Bomb on RPK10

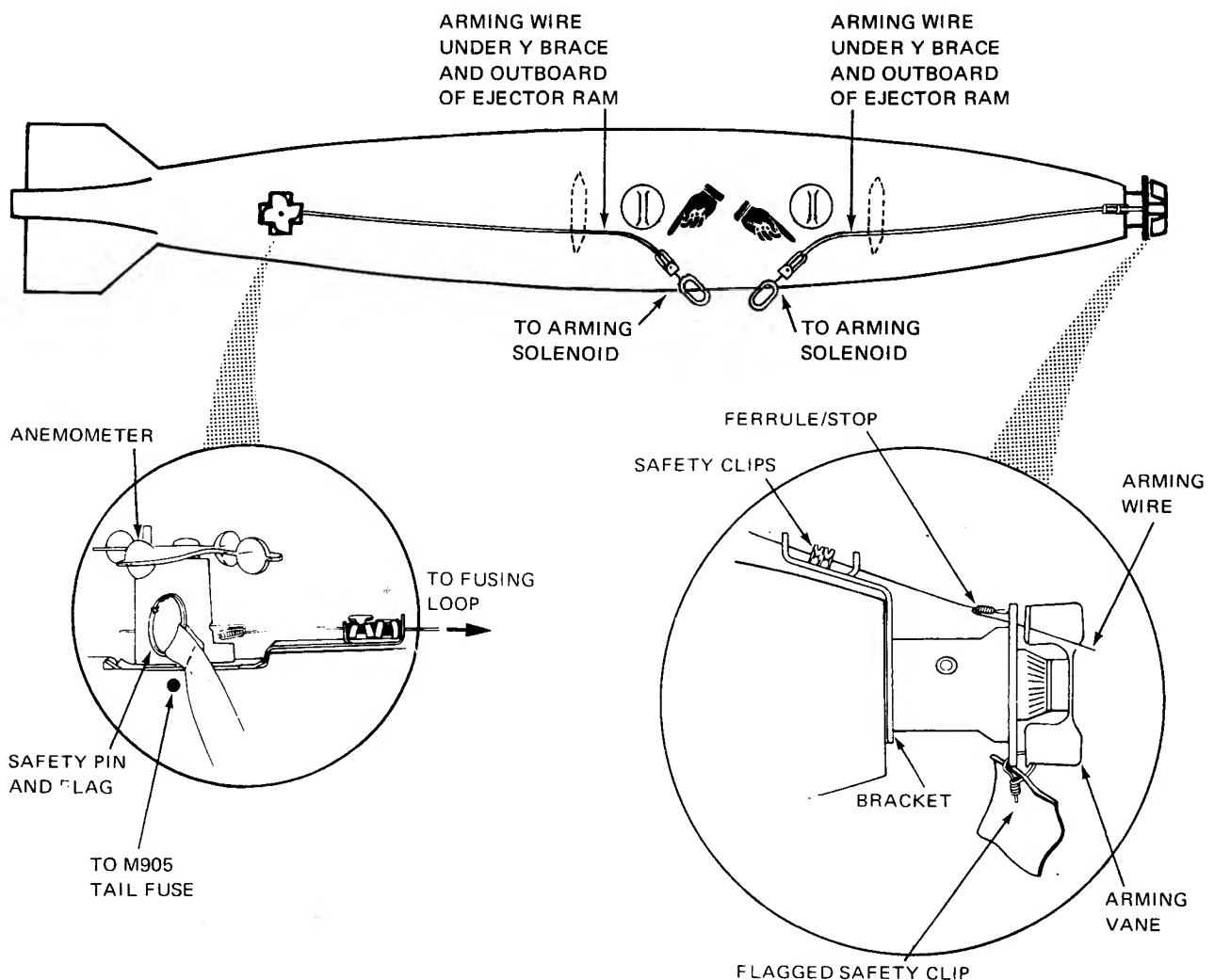


Figure 2-12

At rear of each RPK10 :

10. Intervalometer—Check :
  - a. Bomb mode switch—Correctly set,
  - b. RESET BOMB LOAD switch—Correctly set, and
  - c. TET connector—Disconnected (refer to Fig 2-13).
11. After pilot checks each intervalometer, armourer :
  - a. TET connector—Connects, and
  - b. End cap—Secures.
12. After pre-flight completed, armourer :
  - a. Release unit safety pins—Removes and shows to pilot.
  - b. Inspection covers—Secures.

### AFTER START CHECKS

Perform after start checks for other armament.

### PRE-RELEASE CHECKS

1. Weapon system selector—Desired AIR-GROUND mode.
2. Sight depression rheostat—Set.
3. Bomb fusing switches—As required.
4. Bomb station selector—WINGS
5. SINGLE/SALVO switch—As required.
6. BOMBS switch—On.
7. ARM MASTER switch—ON (amber light on).

### RELEASE

1. Missile/bomb button—Press and hold.  
For multiple releases, the time delay between bombs must be considered and the pilot must hold the missile/bomb button pressed until all bombs release.

## TET Connector Lead

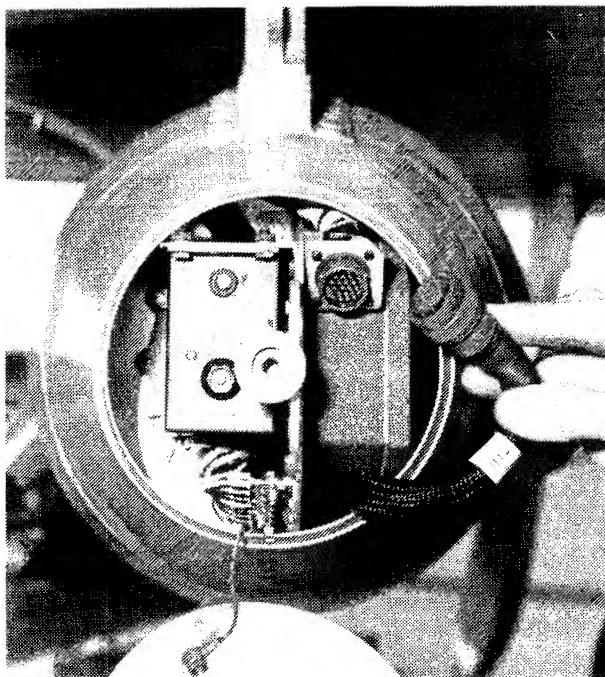


Figure 2-13

### POST RELEASE

1. ARM MASTER switch—Off.
2. BOMBS switch—Off (guard down).
3. Bomb fusing switches—SAFE.
4. Trigger—Safe.

### MK82 SNAKEYE ON RPK10

#### COCKPIT CHECKS

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Nose and tail fusing switches—SAFE.
4. Trigger—Safe.
5. ☒ Bomb fusing switch—SAFE.

#### PRE-FLIGHT LOADED STATIONS

1. Inspection cover—Open.
2. Release unit safety pins—Fitted to each unit (refer to Fig 2-11).
3. Bomb—Securely crutched (bolt tension sensor tabs immovable).
4. Ejector ports—Check settings :

	Port Setting
All Front Stations	7.0 mm front. 7.0 mm rear.
All Rear Stations	1.2 mm front. 7.0 mm rear.

#### Note

At the ejector port setting of 1.2 mm, the thin red line is horizontal; at 7.0 mm setting, the thick red line is horizontal.

5. Arming link assemblies—Positively engaged in arming solenoids.
6. Nose fuse—Check :
  - a. Not fitted for peacetime operations.
  - b. Arming wire—Direct run from solenoid under Y-shaped sway brace to nose fuse (not through front bomb lug, refer to Fig 2-14).
  - c. Vane safety pin—Armourer removes.
  - d. Arming delay—As required.
7. Centre well assembly—Secure.
8. FMU-54/B arming lanyard—Run from rear centre-well hole through the centre-well link into forward centre-well hole to store excess lanyard, then from forward centre-well hole direct to tail arming solenoid (refer to Fig 2-14).

#### Note

The fuse arming lanyard must pass through the centre-well link or the bomb tail will not open.

9. Tail opening lanyard (heavy gauge)—Run from centre-well link through bomb rear lug to tail arming pin.
10. Arming wires—Not crushed or fouled by front or rear ejector rams.

At rear of each RPK10 :

11. Intervalometer—Check :
  - a. Bomb mode switch—Correctly set.
  - b. RESET BOMB LOAD switch—Correctly set.
  - c. TET connector—Disconnected.
12. After pilot inspects each intervalometer, armourer :
  - a. TET connector—Connects.
  - b. End cap—Secures.
13. After pre-flight completed, armourer :
  - a. Release unit safety pins—Removes and shows to pilot.
  - b. Inspection covers—Secures.

#### AFTER START CHECKS

Perform other armament checks.

#### PRE-RELEASE HIGH DRAG DELIVERY

1. Weapon system selector—Desired AIR-GROUND mode.
2. Sight depression rheostat—Set.
3. Nose fusing switch—SAFE.

If the nose fusing switch is inadvertently selected to NOSE for a high drag delivery, and the tail fails to open, the bomb may detonate while the ACFT is within the bomb fragmentation envelope.

## Routeing of Arming Lanyards — High Drag Bomb on RPK10

### WARNING

The nose fuse may only be fitted for combat operations. For peacetime operations a nose plug is fitted.

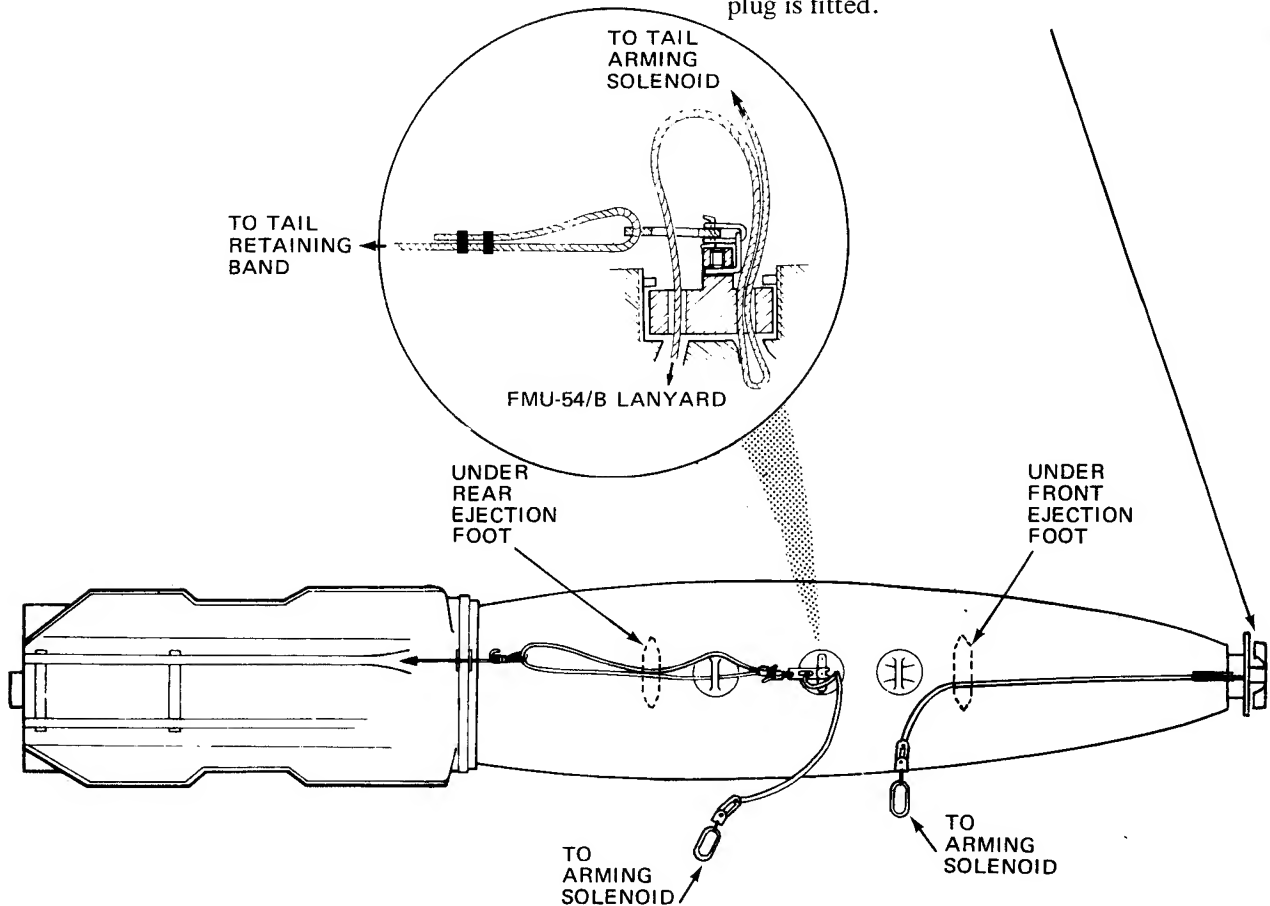


Figure 2-14

### WARNING

Do not select the nose fusing switch to NOSE for high drag deliveries.

4. Tail fusing switch—TAIL.
5. Bomb station selector—WINGS
6. SINGLE/SALVO switch—As required.
7. BOMBS switch—On.
8. ARM MASTER switch—ON (amber light on).

#### PRE-RELEASE LOW DRAG DELIVERY

1. Weapon system selector—Desired AIR-GROUND mode.
2. Sight depression rheostat—Set.
3. Nose fusing switch—NOSE.
4. Tail fusing switch—SAFE.
5. Bomb station selector—WINGS.
6. BOMBS switch—On.
7. ARM MASTER switch—ON (amber light on).

#### RELEASE

1. Missile/bomb button—Press and hold.  
For multiple releases, the time delay between bombs must be considered and the pilot must hold the missile/bomb button pressed until all bombs release.

#### POST RELEASE

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Bomb fusing switches—SAFE.
4. Trigger—Safe.

### GBU-12 LASER GUIDED BOMB ON RPK10

#### COCKPIT CHECKS

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Nose and tail fusing switches—SAFE.
4. Trigger—Safe.
5. ☐ Bomb fusing switch—SAFE.

**PRE-FLIGHT UNLOADED STATIONS**

1. Transfer connector leads—Connected (refer to Fig 2-11).
  2. Initiator leads—Connected to parking studs.
  3. Bomb hooks—Open.
  4. Inspection cover—Closed and secure.
- Ejector rams may be extended.

**PRE-FLIGHT LOADED STATIONS**

1. Inspection cover—Open.
2. Release unit safety pins—Fitted to each unit.
3. Bomb—Securely attached (bolt tension tabs immovable).
4. Ejector port settings— 7 mm front.  
— 7 mm rear.
5. RATCHET CHECK—Engaged.
6. Initiator firing leads—Connected.
7. Detector cover and packing—Removed.
8. Detector housing/ringtail—Undamaged.
9. Seeker head detector window—Clean.
10. Seeker head—Gimbals free.
11. Computer code—Corresponds to mission requirements.
12. Post connector cover—Installed.
13. Thermal battery safety wire and flag—Removed.
14. Thermal battery lanyard—Installed (lanyard routed under the Y brace of the RPK10 and attached to front bracket of MOD 112 Alkan release unit).
15. Canards—Slight movement.
16. Fusing details—Written on side of bomb.
17. Arming wire/lanyards—Correctly positioned in front fusing unit.
18. Charging well safety pin—Removed.
19. Tail latch lanyard—Installed, routed under sway brace and connected to a rear bracket of MOD 112 Alkan release unit.
20. Tail latch assembly safety pin—Removed.

**WARNING**

Fins deploy quickly. Avoid contact with tail latch assembly.

21. Tail latch assembly wing safety pin—Removed.
22. Tail fuse arming wire—Installed (if applicable).

At rear of each RPK10 :

23. Intervalometer—Check :
  - a. Bomb mode switch—Correctly set,
  - b. RESET BOMB LOAD switch—Correctly set.
  - c. TET connector—Disconnected (refer to Fig 2-13).
24. After pilot checks each intervalometer, armourer :
  - a. TET connector—Connects.

- b. End cap—Secures.
25. After pre-flight completed, armourer :
    - a. Release unit safety pins—Removes and shows to pilot.
    - b. Inspection covers—Secures.

**AFTER START CHECKS**

Perform after start checks for other armament.

**PRE-RELEASE CHECKS**

1. Weapon system selector—Desired AIR-GROUND mode.
2. Sight depression rheostat—Set.
3. Bomb fusing switches—As required.
4. Bomb station selector—WINGS.
5. SINGLE/SALVO switch—As required.
6. BOMBS switch—On.
7. ARM MASTER switch—ON (amber light on),

**RELEASE**

1. Missile/bomb button—Press and hold.  
For multiple releases, the time delay between bombs must be considered and the pilot must hold the missile/bomb button pressed until all bombs release.

**POST RELEASE**

1. ARM MASTER switch—Off.
2. BOMBS switch—Off (guard down).
3. Bomb fusing switches—SAFE.
4. Trigger—Safe.

**LANDING WITH UNEXPENDED MK82 BOMBS**

Landing with unexpended MK82 HE bombs is permitted provided :

- a. no bomb release attempt has been made, and
- b. the destination airfield has the required ground personnel, equipment and safety points.

**Note**

If a bomb release attempt has failed, ie the bombs are 'hung-up', landing is not permitted unless the subsequent jettison attempt has failed, refer to LANDING WITH HUNG BOMBS at Section 3.

When landing with unexpended MK82 bombs :

1. If practical, obtain a visual check for possible fuse arming.

**If Fuse Arming is Detected :**

2. Jettison the bombs before landing (refer to Section 3).

**If Fuse Arming Has Not Occurred or The Check is Impractical :**

3. Landing with bombs is permitted.

**Note**

- An armed fuse is indicated by a spinning vane. In normal operations fuse arming is unlikely,

however, a bird strike or flying in rain or hail could cause the arming wires to pull out resulting in fuse arming.

- When landing with bombs, the effect of increased aircraft weight must be considered. One MK82 bomb weighs about the same as 70 gallons of fuel.

#### After Landing :

4. Hold at the designated aircraft safety point.
5. Raise hands—Armourer :
  - a. PM-3—Disconnects the bomb initiator leads.
  - b. RPK10—Disconnects both TET connectors.
6. When cleared by armourer—Taxi to OLA.

### BDU-33C/B BOMBS ON SUU-20A/A

#### COCKPIT CHECKS

Before pre-flight inspection check cockpit switches as follows :

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Trigger—Safe.

### SUU-20A/A Dispenser — Safety Flags

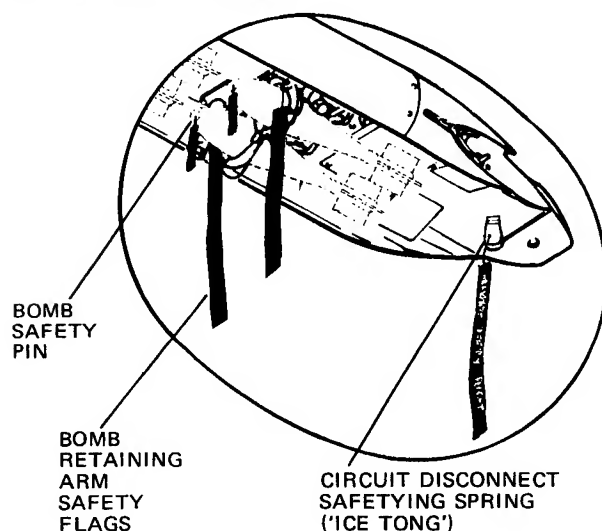


Figure 2-15

#### PRE-FLIGHT CHECKS

1. Safety spring (ice tong) and flag—Installed (refer to Fig 2-15).
2. Dispenser—Secure.
3. Ratchet—In contact.  
The ratchet is visible through the rear peep hole in the bomb beam.
4. PM-3 to dispenser lead—Connected.
5. Bombs—Secure, firmly crutched, no vertical movement.

### Ejector Gun Safety Pin

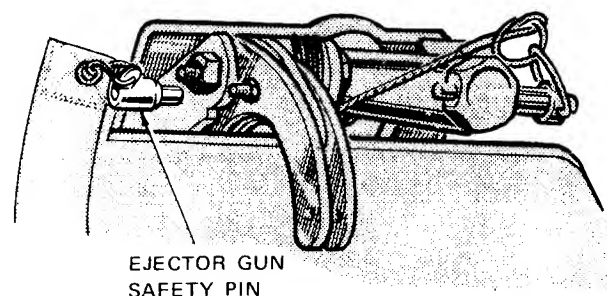


Figure 2-16

### SUU-20A/A Dispenser Intervalometer

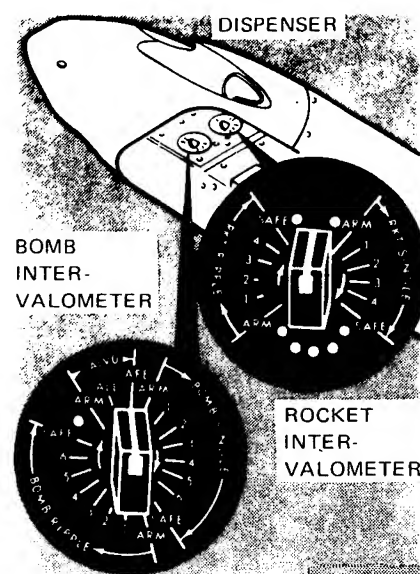


Figure 2-17

6. Ejector cartridge holders—Installed with safety cables fitted.
7. Ejector safety pins (refer to Fig 2-16)—Armourer removes.
8. Bomb safety pins—Armourer removes.
9. Intervalometer (refer to Fig 2-17)—Set by armourer at ARM for appropriate mode (SINGLE or RIPPLE).

#### AFTER START CHECKS

1. Raise hands—Armourer removes safety spring and flag.

#### PRE-RELEASE CHECKS

1. Weapon system selector—Required AIR-GROUND mode.
2. Sight depression rheostat—Set.
3. BOMBS switch—On.

4. Bomb station selector—FUS.

**Note**

- If the SINGLE/SALVO switch is selected to SINGLE and the bomb station selector is on F+W, no bombs can be released.
  - The SINGLE/SALVO switch has no effect on the release of BDU-33 bombs as the release mode is set on the SUU-20A/A bomb intervalometer.
5. ARM MASTER switch—ON (amber light on).

**RELEASE**

1. Missile/bomb button—Press and hold.

**Note**

If RIPPLE is selected, the button must be pressed for at least 0.5 seconds for all 6 bombs to release.

**POST RELEASE CHECKS**

1. ARM MASTER switch—OFF.
2. BOMBS switch—Off (guard down).
3. Trigger—Safe.

**AFTER LANDING CHECKS**

After landing with unexpended or hung BDU-33 practice bombs :

1. Hold at the designated ACFT safety point.
2. Raise hands—Armourer installs safety spring.

**AN/ALQ-72 ECM POD**

**PRE-FLIGHT CHECKS**

1. Pod—Secure.
2. Crutching and all panels—Secure.
3. Ratchet—In contact.
4. Electrical fittings—Connected and secure.
5. Antennae—Condition and security.

**Note**

The pod is not jettisonable.

**PRE-TAKE-OFF CHECKS**

1. Mode selector—STBY.  
After about three minutes the white STBY 1 light illuminates indicating that the pod is ready to transmit.

**OPERATION**

1. Mode selector—XMIT

**Note**

- The green XMIT light is illuminated when the set is actively searching in the selected mode.
- The red AI light illuminates when the pod is transmitting a jamming signal.

**AFTER LANDING CHECK**

1. Mode selector—OFF.

**AN/ALE-32 CHAFF DISPENSER**

**PRE-FLIGHT CHECKS**

1. Dispenser—Secure.
2. Nose cone—Locked.

**PRE-START CHECKS**

1. POWER switch—Off.
2. UNITS/MIN switch—As required.
3. Dispenser switch—Off (centre position).
4. Indicator light—Press to test.
5. RESERVE knob—Set counter (full 135).
6. CHAFF DISP CB—In.
7. Roll trim switch—Left travel until ROLL TRIM light illuminates.

**DISPENSING**

Immediately prior to dispensing :

1. POWER switch—ON.

**CAUTION**

When the POWER switch is selected ON, the drive motor operates; motor operating time should be kept to a minimum.

**Note**

Do not select the POWER switch ON in an unapproved area as a chaff packet can be ejected.

2. UNITS/MIN switch—As required.
3. Dispenser switch—CONT or OVERRIDE.  
The indicator light flashes and the counter operates as the chaff packets are dispensed.

**AFTER DISPENSING**

1. Dispenser switch—Off (centre position).
2. POWER switch—OFF.  
If the indicator light remains on and the counter stops operating, the dispenser is empty or the magazine has jammed. If jamming is suspected, select the POWER switch OFF and do not attempt further dispensing operations.

**CAUTION**

- Using the POWER switch to dispense will damage the drive motor.
- Do not select the dispenser switch to OVERRIDE in an attempt to clear a jammed magazine.



**HIGH PERFORMANCE  
AERIAL TARGET SYSTEM  
STAGE 1****PRE-FLIGHT COCKPIT CHECKS**

1. ARM MSTR switch - OFF.
2. BOMBS switch - Off (guard down).
3. BOMBS fusing switch - SAFE.
4. Guns/Missile trigger - Safe.

**PRE-FLIGHT CHECKS**

1. PM3 rear station - Canister fitted.
2. PM3 release mechanism - Locked.
3. Canister crutching - Firm and secure.
4. PM3 to canister umbilical cable - Connected.

**WARNING**

- When the READY-SAFE switch has been set to READY, and the ejection gun safety key and flag have been removed, personnel are not to move behind the target canister.
  - To avoid passing behind the target once armed, carry out the remaining pre-flight checks after completing the aircraft aft end checks.
5. Cable routing - Top of tray along top of sponge.  
- Bottom of tray to release unit.
  6. Test panel - READY-SAFE switch - READY  
- Panel - Closed.
  7. Release unit - Cable termination - Secure.  
- Safety pin - Removed.  
- Housing cover - Fitted.

8. Nose cone - Secure.  
- Latching relay switch - FLIGHT.  
- Safety pin - Removed.  
- Arming pin - Retracted.
9. Ground shunt plug - Removed.

**PRE-TARGET LAUNCH CHECKS**

1. Bomb fusing switch(es) - SAFE.
2. Bomb station selection - FUS.
3. SINGLE/SALVO switch - SINGLE.
4. BOMBS switch - ON.
5. ARM MSTR switch - ON.

**TARGET LAUNCH**

1. Missile/bomb button - Press.

**POST-TARGET LAUNCH CHECKS**

1. ARM MSTR switch - OFF.
2. BOMBS switch - Off.
3. Guns/missile trigger - Safe.

**PRE-TARGET RELEASE CHECKS**

1. Bomb TAIL fusing switch - TAIL
- D BOMBS fusing switch - DELAY.
2. Bomb station selector - FUS.
3. SINGLE/SALVO switch - SINGLE.
4. BOMBS switch - On.
5. ARM MSTR switch - ON.

**RELEASE**

1. Missile/bomb button - Press.

**POST RELEASE CHECKS**

1. ARM MSTR switch - OFF.
2. BOMBS switch - Off (guard down).
3. BOMBS fusing switch - SAFE.



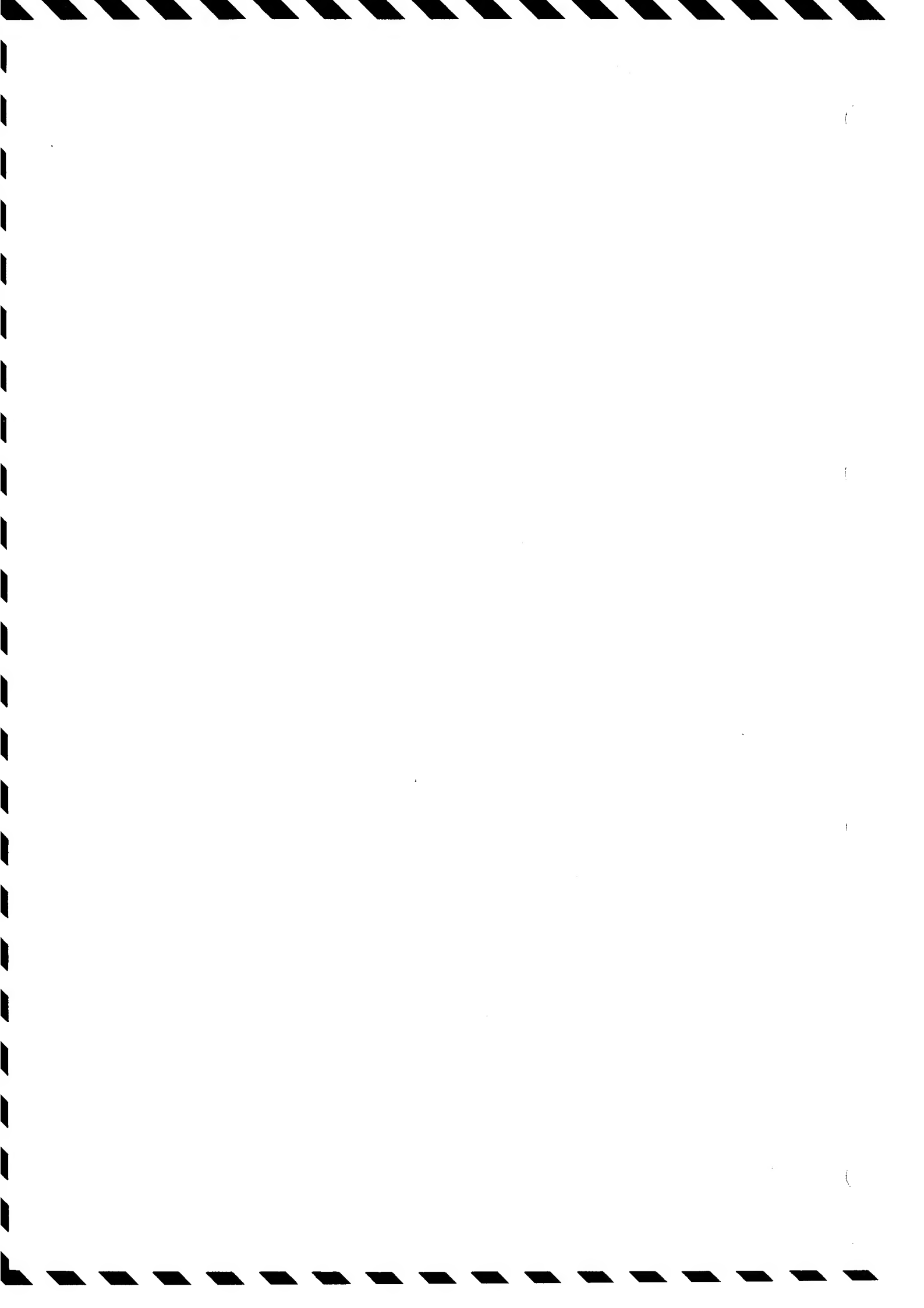
**SECTION 3**  
**EMERGENCY PROCEDURES**

## SECTION 3

## EMERGENCY PROCEDURES

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## SECTION 3

# EMERGENCY PROCEDURES

### MATRA

#### JETTISON

To jettison the Matra :

1. Airspeed—250 KIAS (if possible).
2. FUS jettison button—Press.  
The Matra and pylon are released, the Matra will not self-destruct.

The Matra R530K may also be jettisoned by firing as follows :

1. MISS STND-BY switch—ON.
2. MISSILES switch—ON.
3. ARM MASTER switch—ON.
4. Missile/bomb button—Press.

#### WARNING

The missile will arm and may travel several miles before it self-destructs.

#### MISFIRE

**If the Missile Does Not Fire After One Second and Time Permits :**

1. Repeat FIRING CHECKS.

**If Unsuccessful and a Visual Check is Impractical :**

2. FUS jettison button—Press.
3. Complete the attack using alternative armament.

**If Unsuccessful and a Visual Check is Practical :**

4. MISS STND-BY switch—OFF.
5. Complete AFTER FIRING CHECKS.

#### WARNING

If the missile battery is activated, a fire or explosion in the missile is possible. The escort pilot is to closely monitor the missile battery and rocket motor area for signs of smoke or distortion.

6. RTB with an escort observing missile battery and rocket motor areas.

**If, During RTB, Any Smoke or Abnormal Indications are observed :**

7. FUS jettison button—Press.

### LANDING WITH HUNG MATRA

When landing with the missile after a misfire :

1. Land via a straight-in approach.

After landing and at the designated aircraft safety point :

2. Hold with the aircraft in a safe direction.
3. Raise hands—Armourer disconnects rocket motor and battery leads.
4. When cleared by armourer—Shut down and leave the aircraft.

### MATRA R550 AND TDU-11/B TARGET ROCKET

#### JETTISON

To jettison R550 safe:

1. WING jettison button — Press.

The missiles do not arm and do not self-destruct.

#### Note

R550 missiles can be launched safe throughout the aircraft firing envelope.

#### MISFIRE

If the selected Matra R550 fails to fire, the transfer box automatically selects the other missile for firing. If, after three seconds, a missile fails to fire:

1. Missile/bomb button — Press.

If a missile still fails to leave the launch aircraft:

2. SINGLE/SALVO switch — Change selection.
3. Missile/bomb button — Press.

#### Note

Jettison is not necessary unless an aircraft emergency dictates otherwise.

### LANDING WITH HUNG R550 MISSILES

When landing with hung R550 missiles:

1. Land via a straight in approach.

After landing and at the designated aircraft safety point:

2. Hold with the aircraft pointed in a safe direction.
3. Raise hands — Armourer installs the ground safety pip-pin, raises the 'Ground/Flight' SAFETY LEVER and installs the 'Ground/Flight' SAFETY LEVER safety pin.
4. When cleared by armourer — Shut down and leave the aircraft.

## GUNS

### STOPPAGE

Normal recovery and after landing procedures apply.

### RICOCHET

If a ricochet is evident :

1. Continue planned recovery.

### If Engine Ingestion is Suspected :

2. Check engine parameters and IAS.

### If Thrust is Insufficient for Flight or Engine Failure is Obvious :

3. Eject.

### If Thrust is Sufficient for Flight but Engine is Still Suspect :

4. RTB with escort if possible above MSEA and above 300 KIAS.
5. Perform thrust/engine performance comparison if possible.

### WARNING

- Engine parameters, particularly RPM, may appear normal even though substantial internal damage is present. Confirmation of progressive deterioration in thrust may be made by a performance comparison or by the inability to maintain height and airspeed.
  - Compressor damage can cause high EGT(T4).
6. Land via precautionary forced landing pattern if applicable.
- ### If Airframe Damage is Suspected :
7. Fly to a suitable area close to recovery airfield.
  8. Perform a low speed control check (U/C down above 10 000 ft AGL).

### Note

- Do not plan to touch down at a lower IAS than the minimum flown in the low speed check. The minimum speed should be dictated by the extent of damage.
  - Landing above 200 KIAS will probably result in drag chute failure and barrier engagement.
9. Land via a straight in approach.

## RUNAWAY GUNS

If the guns continue to fire on releasing the trigger :

1. Fly the applicable planned recovery.
2. ARM MASTER switch—OFF.
3. GUNS switch—Off (guard down).
4. Trigger—Safe.
5. Cool the guns in a suitable area for 5-10 minutes.
6. Land via a straight-in approach.

After landing and at the designated aircraft safety point :

7. Hold with the ACFT in a safe direction.
8. Raise hands—Armourer installs gunpack safety pin.
9. When cleared by armourer—Shut down and leave the ACFT.

## MK82 BOMBS

### JETTISON FROM PM-3

Bombs may be jettisoned safe from the PM-3 by :

1. FUS jettison button—Press.

### SAFE RELEASE FROM PM-3

Bombs can also be released safe from the PM-3 by :

1. Weapon system selector—Any AIR-GROUND mode.
2. Bomb fusing switches—SAFE.
3. Bomb station selector—FUS.
4. SINGLE/SALVO switch—SALVO.
5. BOMBS switch—On.
6. ARM MASTER switch—ON.
7. Missile/bomb button—Press and hold until both bombs release.

### WARNING

Although the bombs are released safe, they may explode on striking a hard surface. Bombs should not be jettisoned below the minimum safe release altitude.

### JETTISON FROM RPK10

Bombs may be jettisoned safe from the RPK10 by :

1. WING jettison button—Press.

#### SAFE RELEASE FROM RPK10

Bombs can also be released safe from the RPK10 by :

1. Weapon system selector—Any AIR-GROUND mode.
2. Bomb fusing switches—SAFE.
3. Bomb station selector—WINGS.
4. SINGLE/SALVO switch—SALVO.
5. BOMBS switch—On.
6. ARM MASTER switch—ON.
7. Missile/bomb button—Press and hold until all bombs release.

#### JETTISON ENVELOPE

Bombs should be jettisoned within the normal release envelope. Emergency jettison is cleared up to 40 000 ft.

#### RELEASE FAILURE

If MK82 bombs cannot be released normally, fly to a suitable area for jettison, then :

1. Ensure aircraft is above the minimum safe release altitude and the jettison area is clear.
2. Jettison bombs.

#### WARNING

Do not jettison bombs below the minimum safe release altitude.

#### If the Bombs Cannot be Jettisoned :

3. RTB avoiding built-up areas and plan for a straight-in approach.

#### LANDING WITH HUNG BOMBS

If a bomb release failure occurs, landing with bombs is not to be attempted unless subsequent release or jettison attempts have failed. In certain configurations, when bombs are hung up on the forward stations, the forward CG limit (refer to AAP 7213.003-5) may be exceeded at low fuel states.

When landing with hung bombs :

- a. There are no restrictions with :
  - (1) two bombs or a rear bomb only on PM-3, or
  - (2) bombs on rear RPK10 stations.
- b. The forward CG limit may be exceeded at low fuel states in certain configurations with :
  - (1) a front bomb on PM-3 or
  - (2) bombs on front RPK10 stations.

#### Note

Landing with more than 250 gal of fuel remaining avoids exceeding the forward CG limit regardless of configuration.

- c. With two bombs on one RPK10 use 190 KIAS threshold speed.

#### Note

Significant control problems are not encountered but care is necessary in strong crosswind conditions.

- d. With four bombs on one RPK10 lateral control is lost below 300 KIAS. Landing is not possible.

When landing with bombs, the effect of increased AUW is to be considered. One MK82 bomb weighs about the same as 70 gal of fuel.

#### If the Configuration and Fuel State Indicates the Forward CG is Exceeded :

1. Use a maximum of 40° bank at circuit speeds.
2. Approach to land not below 185 KIAS and avoid a steep approach.
3. Touch down not below 170 KIAS.

When the CG approaches the forward limit, less pitch control than normal is available. However, with the CG encountered with hung bombs, handling difficulties are only significant in high crosswinds.

#### Note

- Less pitch control than normal may be available when CG approaches the forward limit.
- Care should be exercised in strong crosswinds.

After landing with hung bombs :

4. Hold at the designated aircraft safety point.
5. Raise hands—Armourer :
  - a. PM-3—Disconnects initiator leads.
  - b. RPK10—Disconnects both TET connectors.
6. When cleared by armourer—Shut ACFT down.

#### BDU-33 BOMB RELEASE MALFUNCTIONS

##### LANDING WITH HUNG BDU-33

If BDU-33 bombs fail to release :

1. Continue release attempts as applicable.

#### Note

The SUU-20A/A and BDU-33 bombs are non-jettisonable.

#### If the Bombs Cannot Be Released:

2. RTB minimising flight over built-up areas.
3. Normal after landing procedures apply.

#### AN/ALQ-72 ECM POD MALFUNCTIONS

##### If the Red RESET Light Illuminates :

1. RESET button—Press several times as required.

##### If the RESET Light Extinguishes :

2. Continue.



**If the RESET Light Remains Illuminated or Extinguishes Only While the RESET Button is Pressed :**

3. Note whether RESET light illuminates or extinguishes.
4. Mode selector—STBY.
5. Note whether the white STBY 1 light illuminates or not.

Monitoring steps 2 and 4 will assist technicians in fault diagnosis. A schematic fault finding chart is shown at Fig 3-1.

6. Mode selector—OFF.

### **HIGH PERFORMANCE AERIAL TARGET SYSTEM**

#### **TARGET JETTISON**

The jettison of the HIPATS-1 target is as follows :

1. Maximum speed — 220 KIAS
2. Attitude — straight and level ( $\pm 1.0$  'g')
3. Minimum altitude — 300 ft AGL
4. FUS jettison button — Press.

#### **EMERGENCY RELEASE**

In an emergency, the HIPATS-1 target is released from the canister as follows:

1. FUS jettison button — Press.

#### **EMERGENCY CABLE BURN THROUGH.**

The HIPATS-1 target can be emergency released by burning the tow cable through as follows :

1. Airspeed — 220 KIAS.
2. Throttle — Full dry.
3. Speedbrakes — Out.
4. Bunt aircraft — 20° ND.
5. Throttle — Full A/B.
6. Aircraft pitch attitude — Select 20° NU.
7. Cable burn through in less than 5 sec.
8. Throttle — Cancel A/B.

#### **CAUTION**

10m to 15m of tow cable remains on the aircraft. As a precautionary measure do not exceed 240 KIAS.

#### **LANDING WITH HIPATS CABLE ATTACHED**

**If the HIPATS cable fails to burn through:**

1. Approach angle—3 to 4°.
2. Touchdown—6000 ft to run on the upwind side of the runway.

#### **CAUTION**

- At touchdown, lower the nose as soon as possible in case the cable snags airfield equipment.
- Cable end flies approximately 100 ft below the aircraft flight path, whips laterally, and is displaced downwind in a crosswind landing.

## ECM Pod Fault Finding Chart

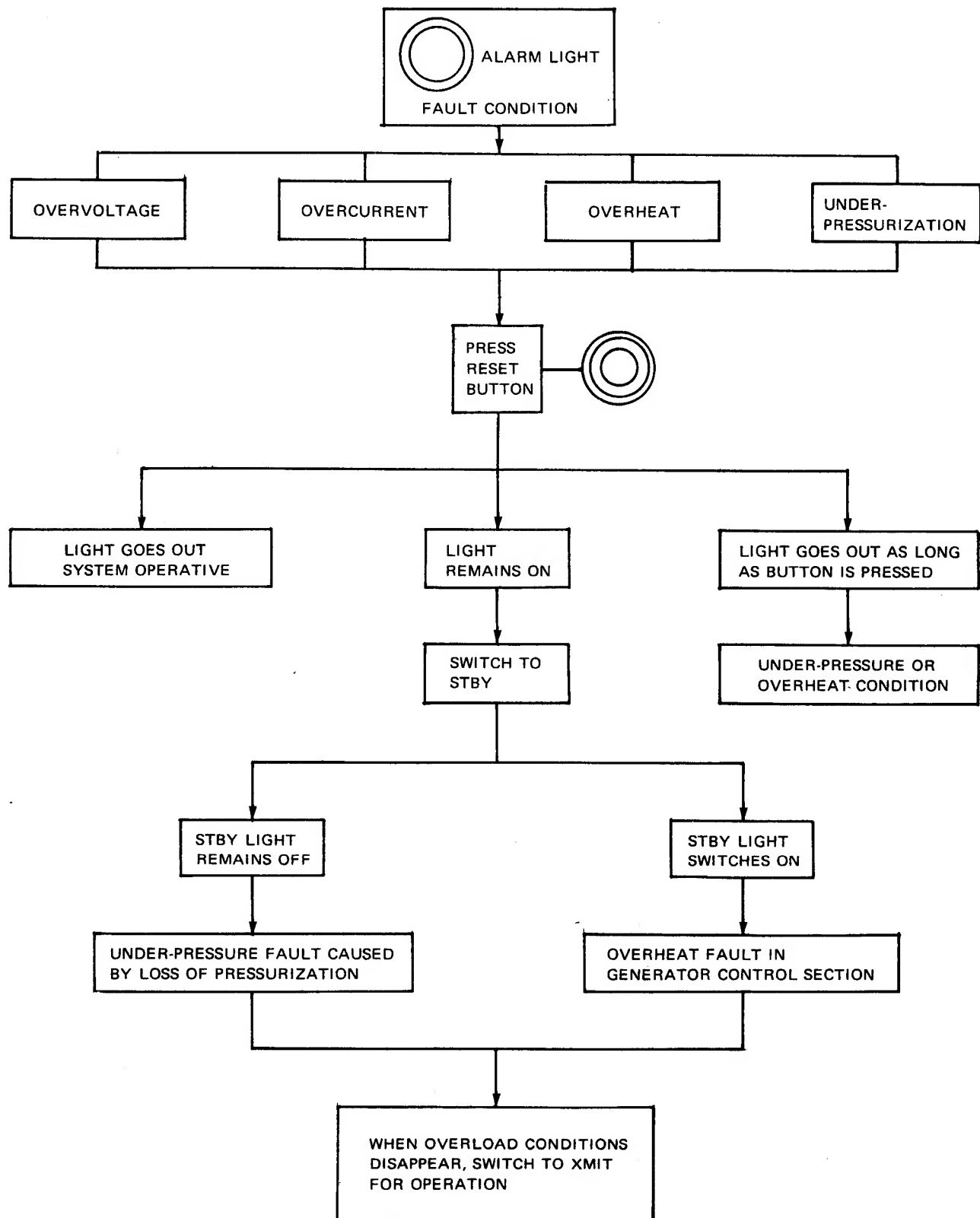
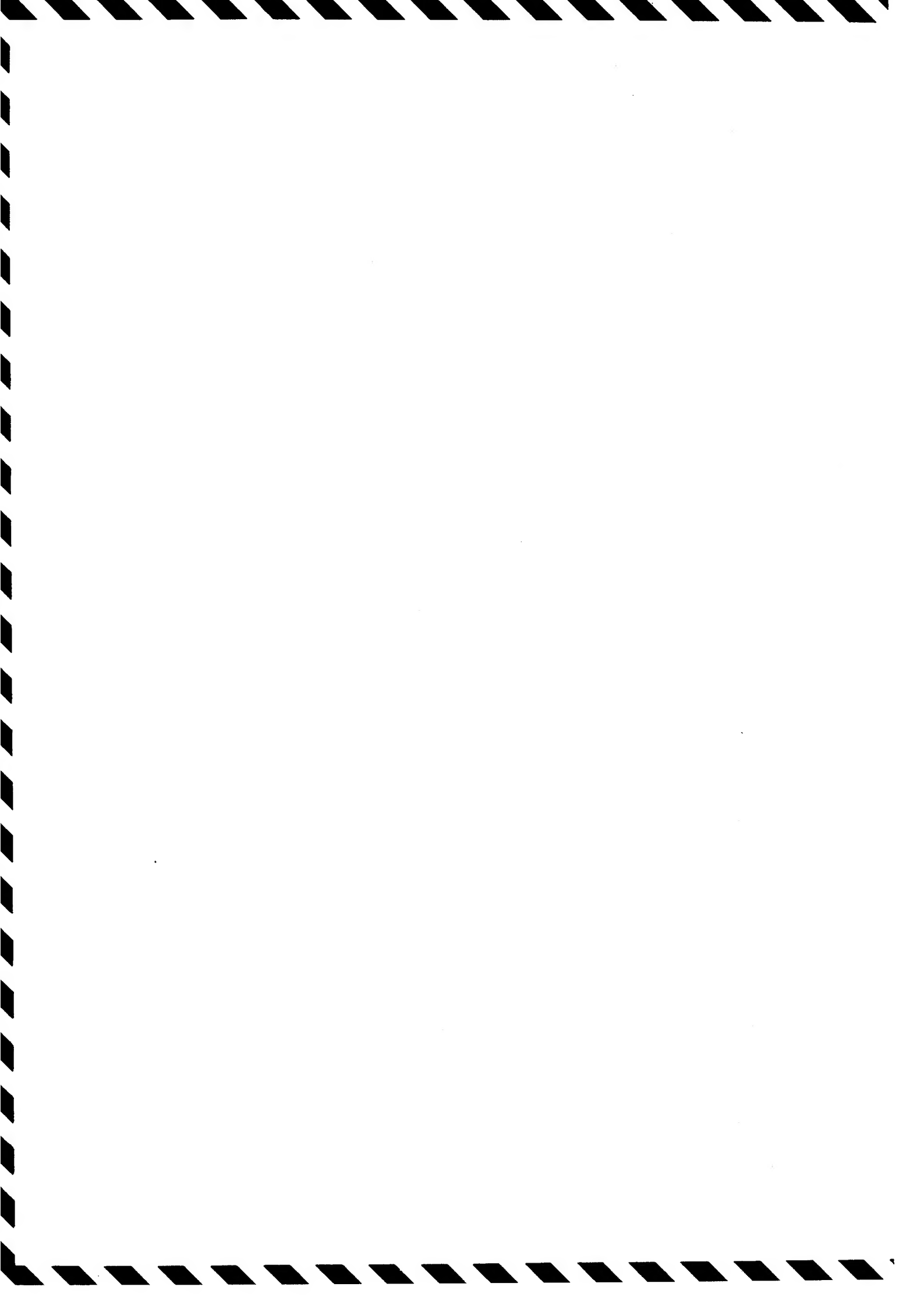


Figure 3-1



**SECTION 4**  
**SUPPLEMENTARY DATA**

**SECTION 4**

**SUPPLEMENTARY DATA**

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## SECTION 4 SUPPLEMENTARY DATA

### HARMONIZATION

Harmonization is the alignment of the optical gunsight pippier, the guns and the radar to indicate the point of projectile impact.

In the Mirage design concept, the guns were envisaged as a tertiary intercept weapon. The guns were to be used after failure to achieve a missile kill, probably under low 'g' and low angle-off conditions, ie at high IAS in the lower altitudes and at speeds of about M1.2 in the higher altitudes. A Mean Fixed Bore Line (MFBL) of 26.5 mils below the Fuselage Reference Line (FRL) results in zero trajectory shift under 1 'g' conditions at high IAS/IMN; therefore this figure is used as a basis for the harmonization of the Defa guns.

### GUN HARMONIZATION

The design harmonization pattern required the lines of fire in azimuth to intersect at 700 metres with the right gun above the left and an overlap of approximately 1 mil. This vertical pattern has the advantage of allowing a greater margin for computation error in the lead plane. The design harmonization pattern has not been achieved and in practice the guns are harmonized with the right gun 25 mil below the FRL and the left gun 28 mil below the FRL, the MFBL being 26.5 mil below the FRL. The guns are mounted on their sides in the pack, 100° from the vertical. To allow for gun movement inboard during firing, they are harmonized divergent from the parallel by 5 mil.

### Defa Gun Harmonization Pattern

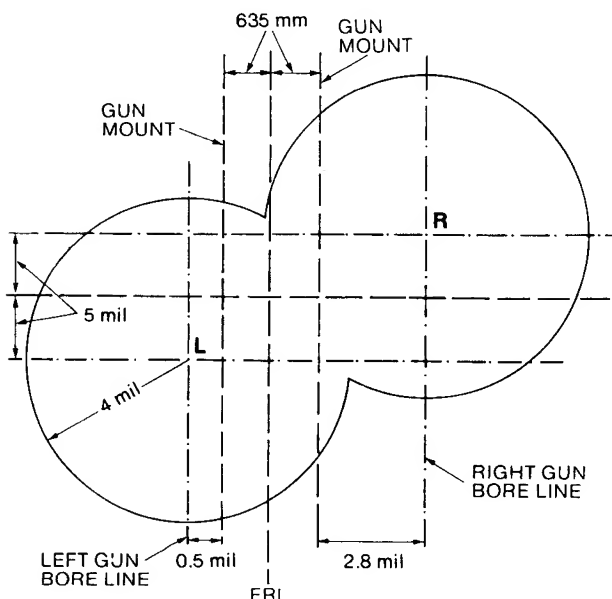


Figure 4-1

Each gun is mounted 635 mm from the aircraft centre-line (0.9 mil at 700 metres) and therefore requires an inwards movement of 5.9 mil to achieve the theoretical pattern at 700 metres. Stop butt firings have shown that the right gun moves inboard an average of only 2.2 mil and the left gun an average of only 4.5 mil. This leaves a divergence from parallel of 2.8 mil for the right gun and 0.5 mil for the left gun (refer to Fig 4-1). The 100% cones of fire from the two guns begin to overlap in azimuth at about 2.7 hm. The 100% cone of fire is about 8 mil (refer to Fig 4-2).

### SIGHT HARMONIZATION

Harmonization of the Mirage is achieved by aligning the optical sight to the guns by use of a reduced range sight screen as opposed to the firing-in method. Basically it is the alignment of three reference lines;

### Overlap of Cones of Fire

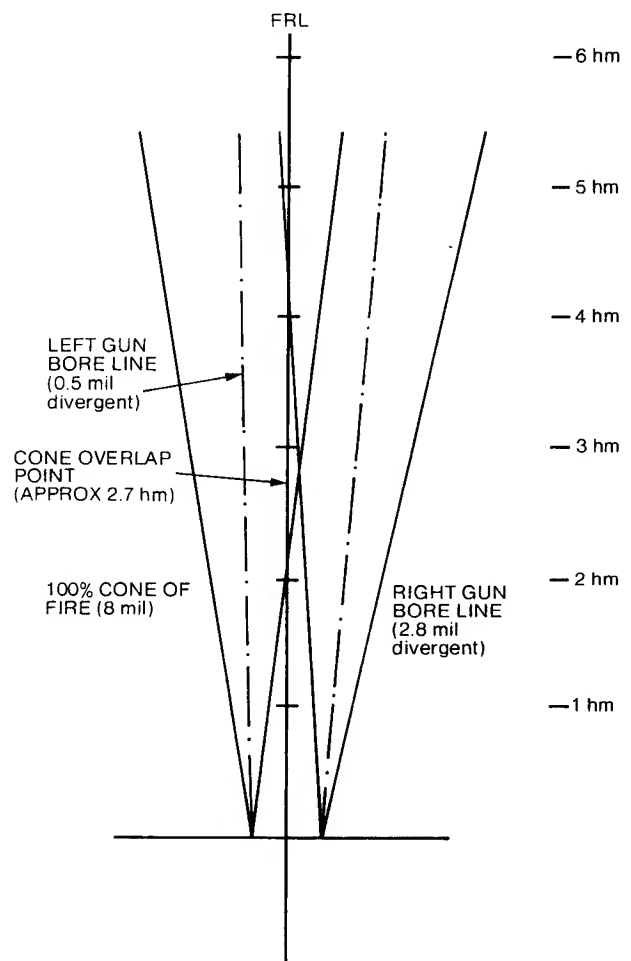


Figure 4-2

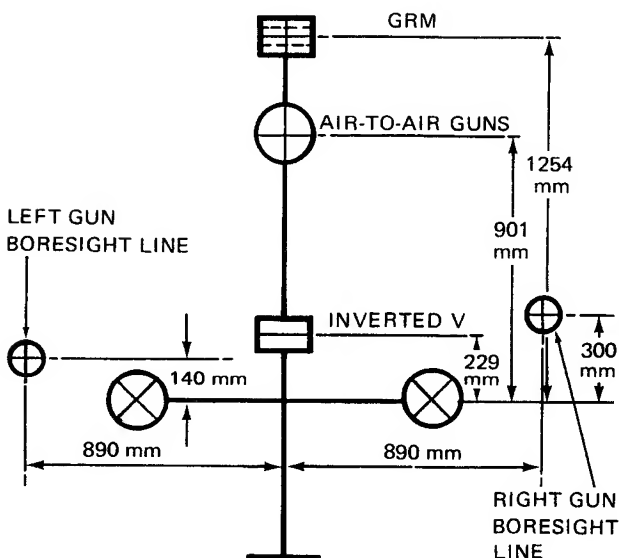
the FRL, the sight line and the MFBL. The gunpack harmonization is performed separately in second line maintenance facilities at 10 000 round intervals. After the pack has been fitted to the aircraft, the gunsight is harmonized by jacking the aircraft up and placing the sight screen precisely 50 metres from the gunsight and then aligning the aircraft to the screen. The white plug is removed and the gunsight allowed to warm up for 8 minutes.

**Note**

With the white plug in, the sight receives altitude input from the ADC and has a sensitivity of 600 metres at MSL (11 mil G/R/M). With the white plug out, the sight receives altitude input of 21 850 ft AMSL and a sensitivity of 600 metres (7 mil G/R/M).

All air-to-air and air-to-ground modes of the gunsight are then adjusted to correspond to the sighting screen (refer to Fig 4-3).

## Harmonization Sighting Screen



**Figure 4-3**

### PILOT'S HARMONIZATION CHECK

After the guns and gunsight have been harmonized, the pilot is to check the harmonization and ensure that the sight is as close to the designed limits as possible. These checks are as follows :

- a. The aircraft is jacked up in the normal manner; check the levelling is within two graduations.
- b. Ensure aircraft sight to screen distance is 50 metres.
- c. Check sighting rods are aligned on sight screen marker.
- d. Check 'white plug' out.
- D** The manual range rheostat must be on 6 hm.
- e. Ensure sight has been on for a minimum of 8 minutes and the radar is off.
- f. Check sensitivity on G/R/M and AIR-AIR GUNS.
- g. Check cover on the lens.
- h. Check AIR-AIR GUNS—No tolerance.
- i. Ensure that the sight head is locked in azimuth. Select AIR-AIR MISS, check inverted 'v' on sight screen reference and check centre pipper on fixed cross ( $\pm 3$  mil).
- D** Select AIR-AIR S.W.
- j. Select G/R/M—With zero depression, pipper should fall on top centre cross—tolerance  $\pm 2$  mil (within crosses)—error annotated on gunsight.
- k. Have white plug re-connected, instrument test equipment removed, and carry out full pilot sight check.

**Note**

The tolerance in AIR-AIR GUNS with white plug in is  $\pm 1$  mil and the tolerance in HE BOMB and G/R/M is  $\pm 3$  mils.

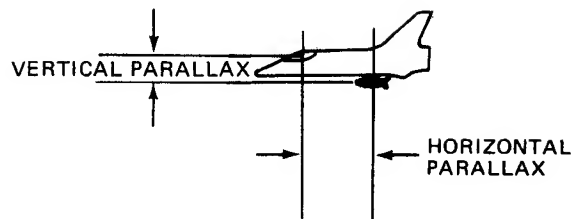
1. Check camera harmonization—Fixed cross 25 mil above aperture centreline.

### SIGHT PARALLAX

Parallax may be defined as the displacement or separation between the optical sight reticule and the point at which the specific armament is suspended. A parallax sighting error results from this separation and any correction applied must use the vertical and horizontal parallax components. The average parallax components are shown in Fig 4-4. These dimensions, modified for dive angle, must be considered whenever sight depression charts are developed for air-to-ground delivery using the optical sight. The correction in terms of mils is included in the aim-off angle data given in the bombing tables.



## Sight Parallax



SIGHT PARALLAX

	PM-3 BOMBS	RPK 10 BOMBS	30 mm GUNS
VERTICAL	5 ft	5 ft	.935 m
HORIZONTAL	18 ft	18 ft	2.316 m
AZIMUTH	NIL	8.5 ft	

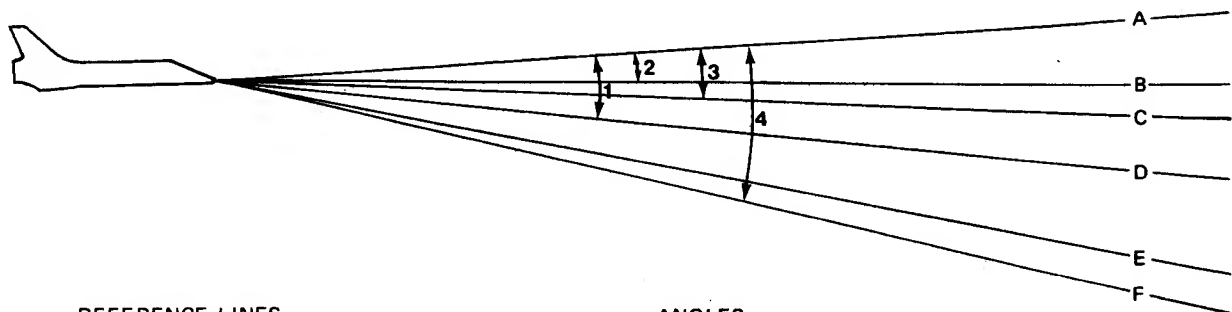
**NOTE:**  
Gun figures are given in metres for convenience  
in using the Defa gravity drop chart, which is in metres.

Figure 4-4

### WEAPONS SYSTEM REFERENCE LINES

The weapons system reference lines are shown in Figure 4-5.

## Weapon System Reference Lines



#### REFERENCE LINES

- A. Fuselage Reference Line
- B. Mean Fixed Bore Line
- C. Pipper Sight Line Air-Air Guns (6 hm sight idle)
- D. Aircraft Flight Path
- E. Radar boresight line Air-Air Range
- F. Sidewinder boresight line

#### ANGLES

- 1. Incidence angle
- 2. Gun depression angle (26.5 mils)
- 3. Pipper depression Air-Air Guns (36.5 mils)
- 4. Sidewinder depression angle (76.5 mils)

Figure 4-5

### WEAPONS AND GUNSIGHT REFERENCES

The weapons and gunsight references are shown in Figure 4-6.

Weapon and Gunsight References

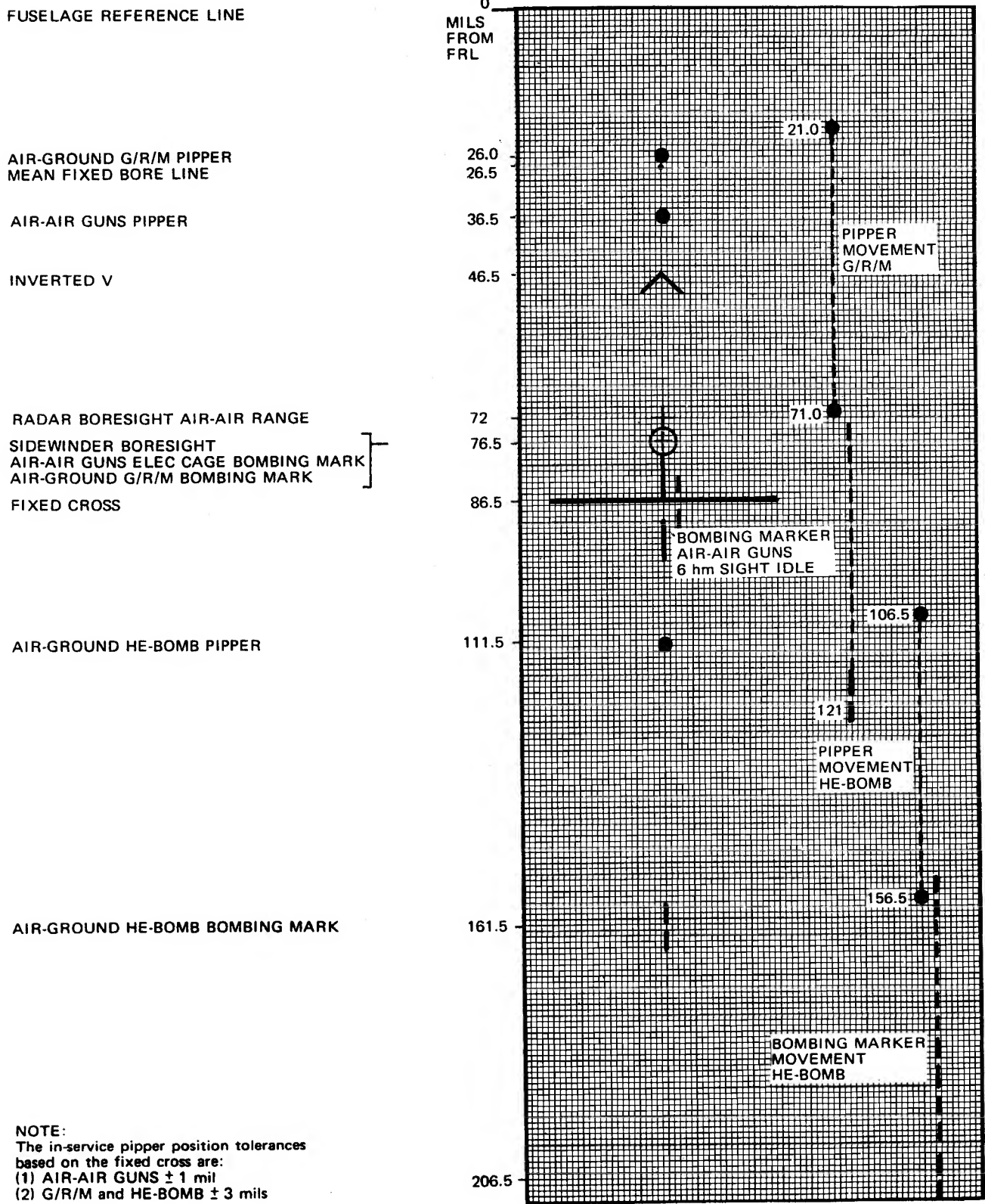


Figure 4-6

**SECTION 5**  
**PLANNING PROCEDURES**  
**AND**  
**SAMPLE PROBLEMS**

## SECTION 5

## PLANNING PROCEDURES AND SAMPLE PROBLEMS

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## SECTION 5

# PLANNING PROCEDURES AND SAMPLE PROBLEMS

This section provides aircrew with the data required to calculate sighting allowances for weapons delivery. This section also describes the planning procedures to be used with the tables provided and demonstrates the use of the tables with sample problems.

The ballistic tables are based on the ISA standard day conditions with the target at sea level. Ambient pressure and temperature variations from the standard day are considered to have negligible effect on trajectory accuracy. This assumption is valid for most conventional weapon delivery conditions because the time of flight is generally short.

### REFERENCE LINES

The various reference lines used in this manual are included in Figure 5-1.

### DIVE BOMBING SIGHTING CALCULATIONS

The dive bombing problem is illustrated in Fig 5-1.

To compute dive bombing sight settings :

- a. select the release conditions.
- b. determine aim-off angle (AOA).
- c. determine angle of incidence,
- d. determine sighting angle or total depression and sight settings, and
- e. apply wind factors if applicable.

### SELECTION OF RELEASE CONDITIONS

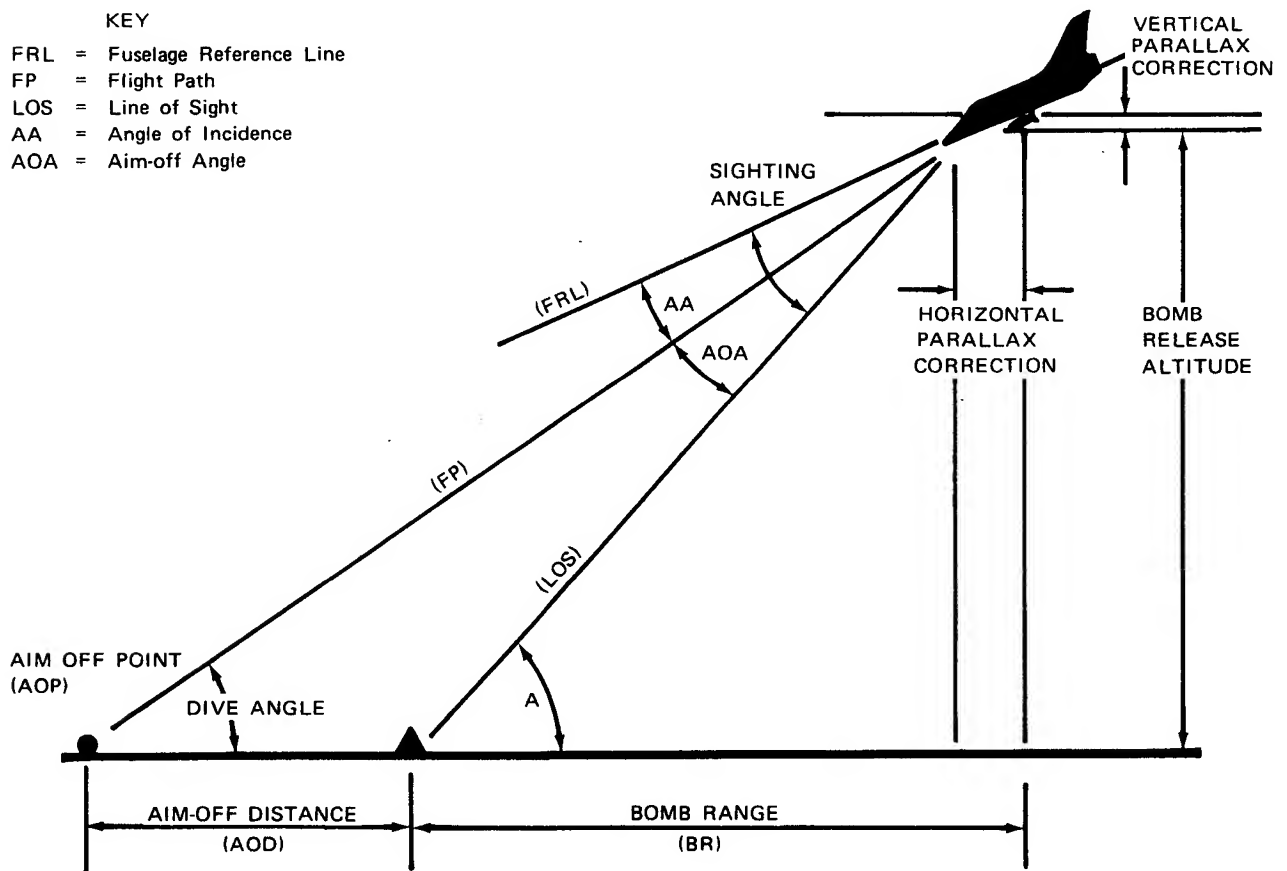
#### Dive Angle

The factors affecting the choice of dive angle are the target, weapons and fusing, terrain, weather and enemy defences.

#### Release Altitude (AGL)

When determining the release altitude, consideration must be given to desired terrain clearance, altitude loss during recovery, altimeter lag, altimeter pressure

## The Dive Bomb Problem



**Figure 5-1**

error and recovery 'g' force. In addition, weapon limitations such as fuse arming time and minimum impact angle must be considered. Finally, the escape distance must be adequate to avoid weapon effects and secondary explosions from the target. The following charts and information contained in Section 6 are used to aid the pilot in planning the release altitude :

- a. Fuse Arming and Safe Escape Charts.
- b. Altimeter Lag Chart.
- c. Altimeter Pressure Error Chart.
- d. Dive Recovery Charts.
- e. Airspeed Conversion Charts.
- f. Exposure Time Charts.
- g. Ballistic Tables.
- h. Maximum Fragmentation Envelope Charts.

Calculate the release altitude using the charts and tables listed above as follows :

- a. Determine the desired minimum recovery altitude or the minimum recovery altitude laid down for the particular weapon (whichever is higher).
- b. Add the height lost during dive recovery to determine release altitude.
- c. Ensure that release altitude provides sufficient time of flight for fuse arming and safe escape.
- d. Add release altitude to the target altitude, and apply altimeter lag and altimeter error corrections to determine indicated release altitude.

### WARNING

- When co-ordinated or trail low level attacks are planned, a minimum safe trail time of 40 seconds between successive releases is to be observed.
- When multiple aircraft dive bombing attacks are planned and successive releases are within 40 seconds, the minimum planned recovery height is to be above the maximum fragmentation envelope.
- If a ripple release is planned, the altitude lost during the ripple interval must be added to the minimum release altitude derived from the dive recovery tables.

### Low-drag Bombing Calculations

The following problem assumes :

- a. Mirage IIIO (WLE) with two 286 gal tanks, full gunpack and two MK82 low-drag bombs on PM-3.
- b. M904E2 and M905 fuses with 4 seconds arming delay.
- c. Target altitude - 1000 ft AMSL.
- d. Release conditions are :
  - (1) 30° dive,
  - (2) 450 KIAS,

- (3) 4000 ft AGL,
- (4) Speedbrakes—In, and
- (5) Fuel remaining—600 gal.
- e. Planned 4 'g' recovery.
- f. Minimum recovery altitude—2520 ft.

Proceed as follows :

- a. From the Airspeed Conversion Chart (refer to Fig 6-1) determine the TAS and Mach No—480 KTAS (5°C) and MO.735.
- b. From the Bomb Ballistic Tables, extract the following :
  - (1) bomb time of fall—7.68 sec,
  - (2) bomb range—5208 ft,
  - (3) bomb slant range—6567 ft,
  - (4) aim-off angle—132 mil,
  - (5) crosswind allowance—129.7 ft per 10 kn, and
  - (6) head/tail wind allowance—14.3/—14.1 mil/10 kn.
- c. From the Dive Recovery Chart (refer to Fig 6-15) determine the altitude lost on a 4 'g' pullout—1275 ft.
- d. Verify Recovery Altitude and Fuse Arming.
  - (1) Planned Release Altitude minus Altitude lost during recovery must be greater than the minimum recovery altitude.  
ie  $4000 - 1275 = 2725$  ft which is greater than 2520 ft.
  - (2) Fuse arming delay plus worst tolerance (M905) must be less than the bomb time of fall.  
ie  $4 \text{ sec} + 30\% = 5.2$  seconds which is less than 7.68 seconds.
- e. From the Table of Basic Weights (refer to Fig 6-21), calculate the weight of the aircraft at weapons release—10 890 kg (22 212 lb).
- f. From the applicable Balance Chart (refer to Fig 6-24), calculate the CG at release—51.5%.
- g. From the applicable Incidence Charts (refer to Fig 6-29), determine the incidence—33 mil.
- h. Calculate the sighting angle (total sight depression).
  - (1) Nil wind sighting angle = true incidence + aim-off angle.  

$$= 33 + 132$$

$$= 165 \text{ mil.}$$
- i. Calculate the nil wind sight setting (refer to Fig 4-6).
  - (1)  $165 \text{ mil} - 111.5 \text{ mil}$  (basic setting HE BOMB) = 54 mils. Thus the release sight setting using the pipper is HE BOMB + 45 mils releasing 9 mils past the target.
  - (2)  $165 \text{ mil} - 161.5$  (basic setting bombing marker in HE BOMB) = 4 mils. Thus the release sight setting is HE BOMB + 4 mil releasing with the bombing marker on the target.

- j. Calculate the sight setting and sight picture for the predicted wind using the appropriate method shown under WIND CORRECTION COMPUTATIONS.

#### High-Drag Bombing Calculations

The calculation of the nil wind sight setting for delivery of a high-drag bomb is identical to the method for delivery of low-drag bombs. However, for given release parameters, the allowance for cross wind is greater for a high-drag delivery, and also the sight depression will be larger. Typical ballistic information for a high and low-drag delivery is compared below :

	MK82 Low-drag	MK82 High-drag
Dive Angle	30°	30°
Altitude (ft)	3000	3000
KTAS	480	480
Time of Fall (sec)	6.03	11.91
Bomb Range (ft)	4113	2939
Bomb Slant Range	5091	4200
Aim-off Angle (mils)*	108	285
10 kn Wind Factor :		
Crosswind (ft)	101.8	203
Headwind (mils)	13.7	36.7
Tailwind (mils)	-13.5	-34.3

\*Aim-off angle corrected for parallax, ie sight depression from flight path.

Because of the high crosswind factor, the aircraft track must be offset into wind for high-drag deliveries or large miss distances will result. Calculation of aircraft track offset for high-drag releases is covered in wind correction computations.

#### Sight Setting for Impact Short of Target

A sight setting for impact short of the target may be required for the release of CBU fire bombs or multiple release weapon delivery. If an impact 100 ft short is desired, the new aim-off angle can be calculated using the previous example as follows :

- New bomb range desired is  
5208 + 100 = 5308 ft.
- Using Aim-off Angle Chart for 30° (refer to Fig 6-37), enter at a bomb range of 5308 ft, project across to 4000 ft AGL release height and read down to obtain  
AOA = 123 mils.
- Calculate new sighting angle as shown previously by adding angle of attack to the new aim-off angle.

The new aim-off angle can also be calculated using the following method :

- Calculate the new angle subtended by the sight

line and the horizontal (refer to Fig 5-1) by

$$\begin{aligned}\tan A &= \frac{\text{Release Altitude} - \text{Vertical Parallax}}{\text{Bomb Range for Short Impact} - \text{Horizontal Parallax}} \\ &= \frac{4000 - 4.7}{5308 - 18.1} \\ &= .7553 \\ \text{and } A &= 37.0630\end{aligned}$$

The parallax correction factors are obtained from Fig 6-56.

- Find new aim-off angle

$$\begin{aligned}\text{AOA} &= A - \text{Dive Angle} \\ &= 37.063 - 30 \\ &= 7.063^\circ \\ &= 7.063 \times 17.45 \\ &= 123.2 \text{ mils}\end{aligned}$$

- Calculate sighting angle as described previously.

#### WIND CORRECTION COMPUTATIONS

##### Upwind Aimpoint

The use of an upwind aimpoint gives flexibility in attack heading and may be calculated in feet or mils. An upwind aimpoint is valid for all attack headings and for fully-drifting or fully-crabbed approaches. The upwind aimpoint in feet is calculated as follows :

- Obtain the average wind 500 to 1000 ft above the planned release altitude,
- Multiply the Wind Correction Factor (ft/kn) by the wind velocity to give the upwind aimpoint in feet.

Using the example from the Low-drag Bombing Calculations, assume an average release wind of 15 kn from 060°, then :

$$\begin{aligned}\text{Upwind Aim Point} &= \frac{129.7}{10} \text{ ft/kn} \times 15 \\ &= 194.6 \text{ ft}\end{aligned}$$

The appropriate sighting reference should be placed 195 ft from the target directly into wind (060°) at the release point.

When a suitable distance reference is not available, the use of the upwind aimpoint in feet may not be practical. The upwind aimpoint in mils has the advantage that the release point can be estimated directly using the sight reticule. The upwind aimpoint in mils is calculated as follows :

- Obtain the average rangewind correction using



the Head/Tail mil/10 kn wind correction figures from the ballistics tables. For example, for the bombing example used previously :

$$\text{Rangewind Correction} = \frac{14.1 + 14.3}{2} \text{ mil/10 kn} \times \frac{1}{10}$$

$$= 1.42 \text{ mil/kn.}$$

- b. Obtain the crosswind correction factor in mils/kn from the calculation :

$$\text{Crosswind Correction} = \frac{\text{cross ft/kn} \times 1000}{\text{Sight Slant Range}}$$

For the example :

$$\begin{aligned} \text{Crosswind Correction} &= \frac{(129.7 \times 1/10) \times 1000}{6567 - 18.1} \\ &= 1.98 \text{ mil/kn} \end{aligned}$$

- c. Calculate average crosswind and rangewind mil/kn figures :

$$\text{Average Wind Allowance} = \frac{\text{Rangewind} + \text{Crosswind}}{2}$$

$$= \frac{1.42 + 1.98}{2}$$

$$= 1.7 \text{ mil/kn}$$

- d. Obtain the upwind aimpoint in mils :

$$\begin{aligned} \text{Upwind Aimpoint} &= 1.7 \text{ mil/kn} \times 15 \text{ kn} \\ &= 25.5 \text{ mil} \end{aligned}$$

Place the appropriate sighting reference 25 mils upwind of the target (060°).

### Crosswind

There are two techniques used to correct for a crosswind; drifting and crabbing. The terms drifting and crabbing relate to relative motion with respect to real or imaginary lines on the ground. In Figure 5-2, Aircraft No 1 is crabbing with respect to line AB and drifting towards line DB to the target. Aircraft No 2 is drifting with respect to line AB and crabbing along line CB to the target. Both aircraft are in coordinated flight and have the sighting reference on the same upwind aim point at release.

### Crosswind Correction (Feet)

The sight offset in feet is calculated by multiplying the crosswind component, as calculated from Fig 6-20, by the CROSS FT/kn figure obtained from the ballistics tables. If the tables give CROSS FT/10 kn, divide by 10 to obtain CROSS FT/kn.

### Crosswind Correction (mils)

The crosswind correction is often more useful in

## Drifting and Crabbing

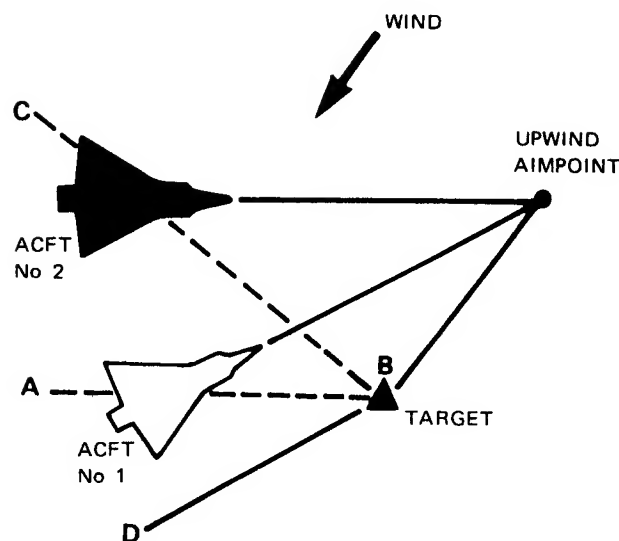


Figure 5-2

mils than in feet and is obtained as follows :

$$\text{Crosswind Correction} = \frac{\text{Cross ft/kn} \times 1000}{\text{Sight Slant Range}}$$

where the sight slant range is equal to the bomb slant range (ballistic tables) minus the horizontal parallax (refer to Fig 6-56). For the bombing example :

$$\begin{aligned} \text{Crosswind Correction} &= \frac{12.97 \times 1000}{6567 - 18.1} \\ &= 1.98 \text{ mil/kn} \end{aligned}$$

The sight offset in mils is calculated by multiplying the crosswind correction in mils/kn by the crosswind component.

### Rangewind

The wind effect on the bomb in feet, imparted by aircraft drift at release, is given by the CROSS FT/kn figure (or  $1.69 \times \text{Time of Flight}$ ) and this holds true whether the wind is range or cross.

In the case of rangewind, the wind effect in mils is slightly different for head or tail winds. This difference arises because the correction angle subtended by the wind effect in feet is different in the head and tail wind sectors. The correction angle is dependent on dive angle, aim-off angle and slant range (refer to Fig 5-3). The correction factors are shown as Head/Tail mils/kn in the ballistic tables.

$$\text{Correction} = \text{Rangewind} \times \text{Head or Tailwind correction factor.}$$

## Head Tail Wind Correction Angle

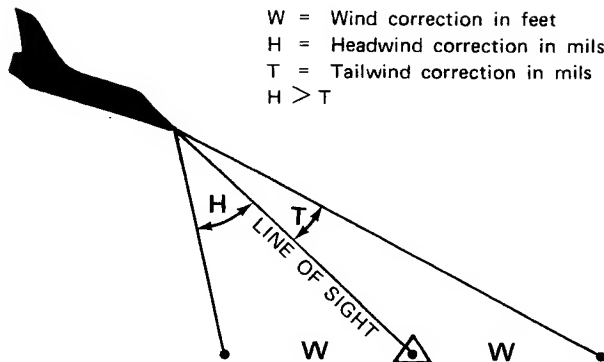


Figure 5-3

The correction can be applied either by :

- adjusting the aimpoint; long for headwind, short for tailwind, or
- adjusting the sight depression to give a release sight picture abeam the target; add mils for headwind, subtract mils for tailwind.

### Crosswind Track Offset

With low-drag weapons, the bomb trail distance is generally small and if aircraft heading is maintained after release, the bomb impacts almost under the aircraft, ie when releasing a low-drag weapon at low altitude the aircraft tracks almost directly over the target. The increased bomb trail distance of high-drag weapons requires the aircraft track to be offset a significant distance into wind when releasing in crosswind conditions.

Figure 5-4 compares crabbing releases of MK82 high-drag and low-drag weapons with the release conditions such that the time of flights are equal. In both cases, the aircraft track passes through the target. The low-drag bomb impacts very close to the target due to the small bomb trail distance. The high-drag weapon impacts at a lateral distance of 40 feet from the target due to the large bomb trail distance. To hit the target the pilot must offset his approach track upwind by 40 feet, thus having the pipper on the upwind aimpoint at release. Computation of this crosswind track offset is discussed later. Note that both high and low-drag bombs drift downwind 86 feet due to the equal time of flight. It is the difference in bomb ranges that cause the track offsets to vary from two feet for low-drag to 40 feet for high-drag weapons.

A fully-crabbing delivery is difficult to attain and in practice a partially-drifting, partially-crabbing approach is flown. This technique can be described as a series of small downwind drifts countered by upwind corrections to maintain a desired track. The aircraft at release may be between a fully-drifting

and fully-crabbing position, however if the weapon is to hit the target the pipper must always be on the upwind aimpoint at release (refer to Fig 5-5).

### Calculation of Track Offset

The required track offset is calculated using the following formula :

$$\text{Track Offset} = \text{CROSS ft/kn} - \frac{\text{Bomb Range}}{\text{KTAS} \times \cos \theta}$$

where KTAS = aircraft TAS at release in kn and  
 $\theta$  = Dive Angle.

Applying this equation to the bombing problems shown in Fig 5-4 :

#### a. Low-Drag.

$$\begin{aligned} \text{Track Offset} &= 8.6 - \frac{4720}{560} \\ &= 0.2 \text{ ft/kn} \end{aligned}$$

#### b. High-Drag.

$$\begin{aligned} \text{Track Offset} &= 8.6 - \frac{2571}{560} \\ &= 4.0 \text{ ft/kn} \end{aligned}$$

therefore for the 10 kn crosswind depicted at Fig 5-4 the Crosswind Track Offset is 40 ft.

### MULTIPLE RELEASE SIGHTING CALCULATION

When a multiple release sequence is used, it is usually desirable to have the pipper aligned to the centre of the bomb pattern. The alignment is achieved by calculating a new aim-off angle based on the bomb range adjusted by half the bomb pattern length. This compensates for pilot delivery errors which could result in the bomb pattern undershooting or overshooting the target. For other tactical situations, the bomb pattern can be moved long or short from the aim-point by adjusting the bomb range of the first bomb within the limits of the pattern length. Figure 5-6 depicts a multiple release and outlines the terms of the pattern length formula.

#### Pattern Length

The bomb pattern length can be obtained by using :

- the Bomb Spacing Charts (refer to Fig 6-57 or 6-58), or if these are unavailable,
- the pattern length (PL) formula.

#### Pattern Length Formula

The length of the bomb pattern for a multiple release can be calculated as follows :

$$PL = \{I_r \times V_r \times \cos \theta \times (N-1)\} - \Delta R$$

where :

$I_r$  = Release interval between successive bombs.

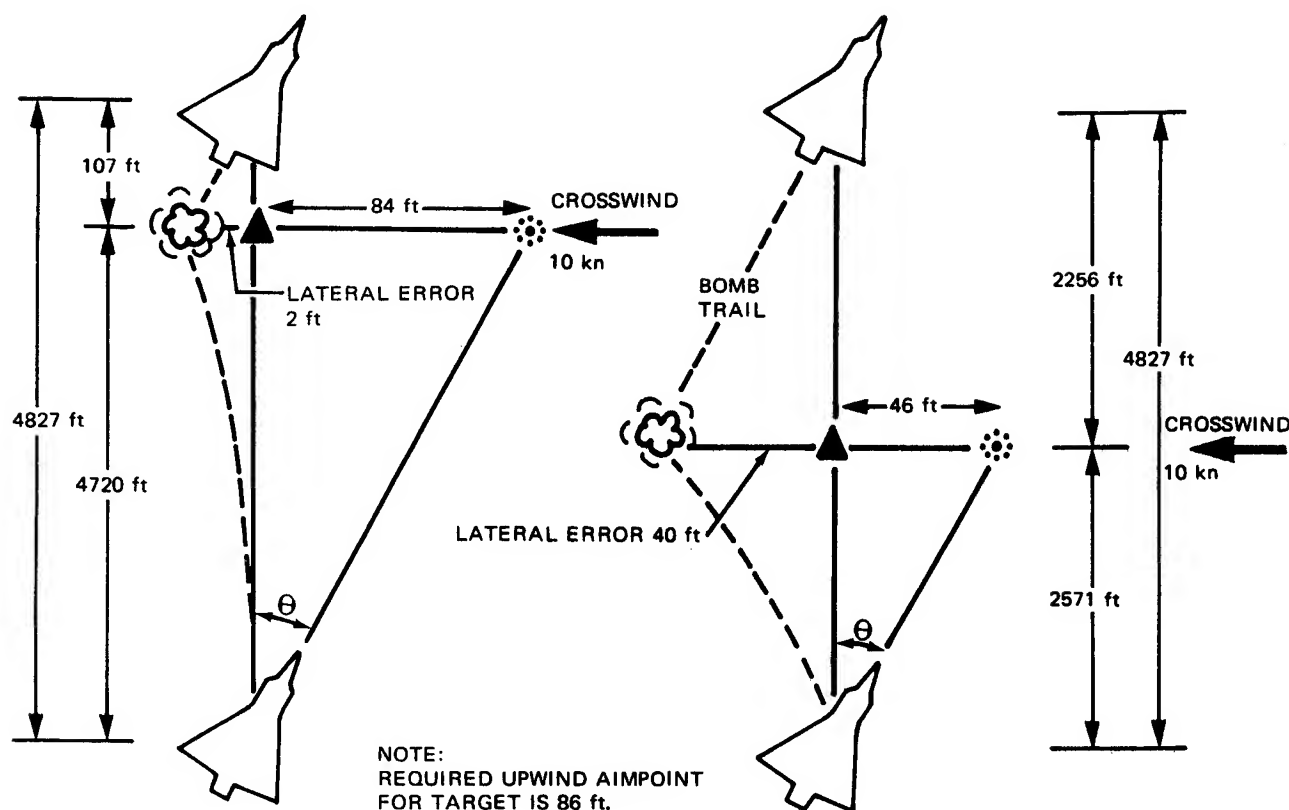
$V_r$  = Release TAS in ft/sec.

$\theta$  = Dive angle.

$N$  = Number of bombs released.

$\Delta$  = Difference in bomb range between the first and last bombs.

# High and Low Drag Weapon Release in Crosswind



## NOTE:

Angle  $\theta$  is greatly exaggerated in the above diagrams. Also, crosswind is depicted at right angles to intended aircraft track and bomb range and aircraft travel are measured along aircraft track. While these assumptions are not technically correct, they are very close when  $\theta$  is small; therefore they have been ignored for simplicity.

**EXAMPLE**  
MK82 Snakeye (low-drag)  
560 KTAS (946 ft/sec)  
450 ft AGL  
4720 ft Bomb Range  
5.1 sec Time of Flight  
8.6 CROSS ft/kn

**ACFT TRAVEL**  
 $946 \times 5.1 = 4827 \text{ ft}$

**CRAB ANGLE**  
10 Kn Crosswind  
 $\sin \theta = 10/560$   
 $= 0.01785$   
 $= 1.02^\circ$

**REQUIRED OFFSET**  
 $\sin \theta = \chi/4720$   
 $\chi = 4720 \times 0.0178 = 84 \text{ ft}$

**ERROR**  
 $86 \text{ ft} - 84 \text{ ft} = 2 \text{ ft}$

**EXAMPLE**  
MK82 Snakeye (high-drag)  
560 KTAS (946 ft/sec)  
300 ft AGL  
2571 ft Bomb Range  
5.1 sec Time of Flight  
8.6 CROSS ft/kn

**ACFT TRAVEL**  
 $946 \times 5.1 = 4827 \text{ ft}$

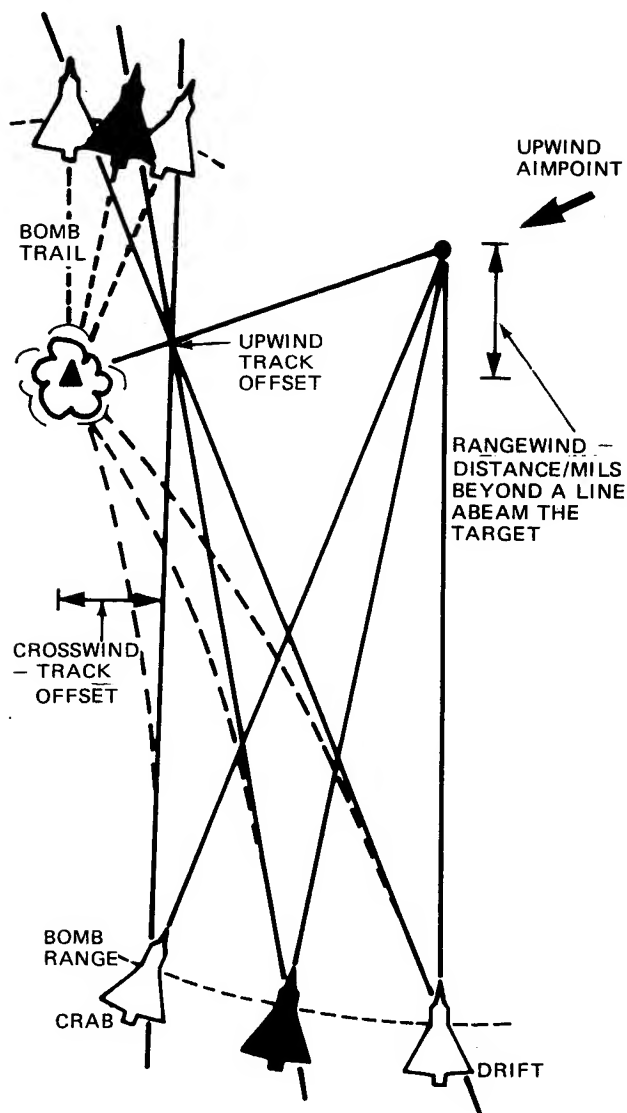
**CRAB ANGLE**  
10 Kn Crosswind  
 $\sin \theta = 10/560$   
 $= 0.01785$   
 $= 1.02^\circ$

**REQUIRED OFFSET**  
 $\sin \theta = \chi/2571$   
 $\chi = 2571 \times 0.0178 = 46 \text{ ft}$

**ERROR**  
 $86 \text{ ft} - 46 \text{ ft} = 40 \text{ ft}$

Figure 5-4

## Upwind Aimpoint



**Figure 5-5**

### Calculation of Pattern Length

Assume the following release parameters :

- Dive angle  $\theta = 45^\circ$ .
- Release height—4000 ft.
- Release TAS—480 KIAS =  $480 \times 1.69$   
= 811 ft/sec.
- Number of bombs in pattern—8.
- Release interval—0.15 sec.

In the pattern length equation all items may be directly obtained from available data except for  $\Delta R$ . For dive releases,  $\Delta R$  must be interpolated from the bomb ballistics tables. To determine  $\Delta R$  :

- Determine altitude lost during release :

$$\begin{aligned} \text{Altitude Lost} &= I_r \times V_r \times \sin \theta \times (N-1) \\ &= 0.15 \times 811 \times 0.7071 \times (8-1) \\ &= 602 \text{ ft.} \end{aligned}$$

or alternatively, using the Horizontal/Vertical component ( $H_c$  or  $V_c$ ) chart :

$$\begin{aligned} \text{Altitude Lost} &= 0.15 \times (N-1) \times V_c \\ &= 0.15 \times (8-1) \times 573 \\ &= 602 \text{ ft} \end{aligned}$$

- Determine first and last bomb range :

- From ballistics tables :  
First bomb range = 3358 ft.
- From ballistics tables :  
Bomb range for 3500 ft release = 2987 ft.
- Difference =  $3358 - 2987$   
= 371 ft.

- Obtain  $\Delta R$  by interpolating the difference in bomb range for the 300 ft increment versus the altitude lost during the ripple release :

$$\begin{aligned} \frac{\Delta R}{602} &= \frac{371}{500} \\ \Delta R &= \frac{371 \times 602}{500} \end{aligned}$$

$$= 447 \text{ ft.}$$

- Determine the pattern length (PL) using the formula :

$$\begin{aligned} PL &= I_r \times V_r \times \cos \theta \times (N-1) - \Delta R \\ &= 0.15 \times 811 \times 0.7071 \times (8-1) - 447 \\ &= 155 \text{ ft.} \end{aligned}$$

$$\therefore \frac{1}{2} PL = 77 \text{ ft, or}$$

- Calculate the pattern length using the appropriate bomb spacing chart :

- bomb spacing for 0.15 second interval is 22 ft, and
- pattern length is bomb spacing multiplied by  $(N-1)$   
 $PL = 22 \times (8-1)$   
= 154 ft.

### Calculation of Sighting Angle

Determine the new aim-off angle for the adjusted bomb range by adding half the pattern length to the first bomb range as shown under Sight Setting for Impact Short of Target. The sighting angle is obtained by adding the angle of incidence to the new aim-off angle.

### INITIAL SIGHT PLACEMENT CALCULATION

Immediately after roll out the aircraft flight path should be towards the pre-computed aim-off point beyond the target. If the roll out airspeed, altitude and dive angle are correct, the sighting reference should be the pre-computed distance below the target. The inverted V is generally very close to the aircraft flight path at roll out airspeeds and can be used as a flight path indicator at this time. However, since the aim-off point may be difficult to identify, the sighting reference position at roll out is generally more useful.

## Pattern Length Formula

$$PL + BR_1 = BR_L + S$$

$$PL = S - BR_1 + BR_L$$

$$= S - (BR_1 - BR_L)$$

where:

PL = Pattern Length

S = ACFT horizontal travel during release  
( $I_R V_R \cos \theta (N-1)$ )

$BR_1$  = Bomb Range (first)

$BR_L$  = Bomb Range (last)

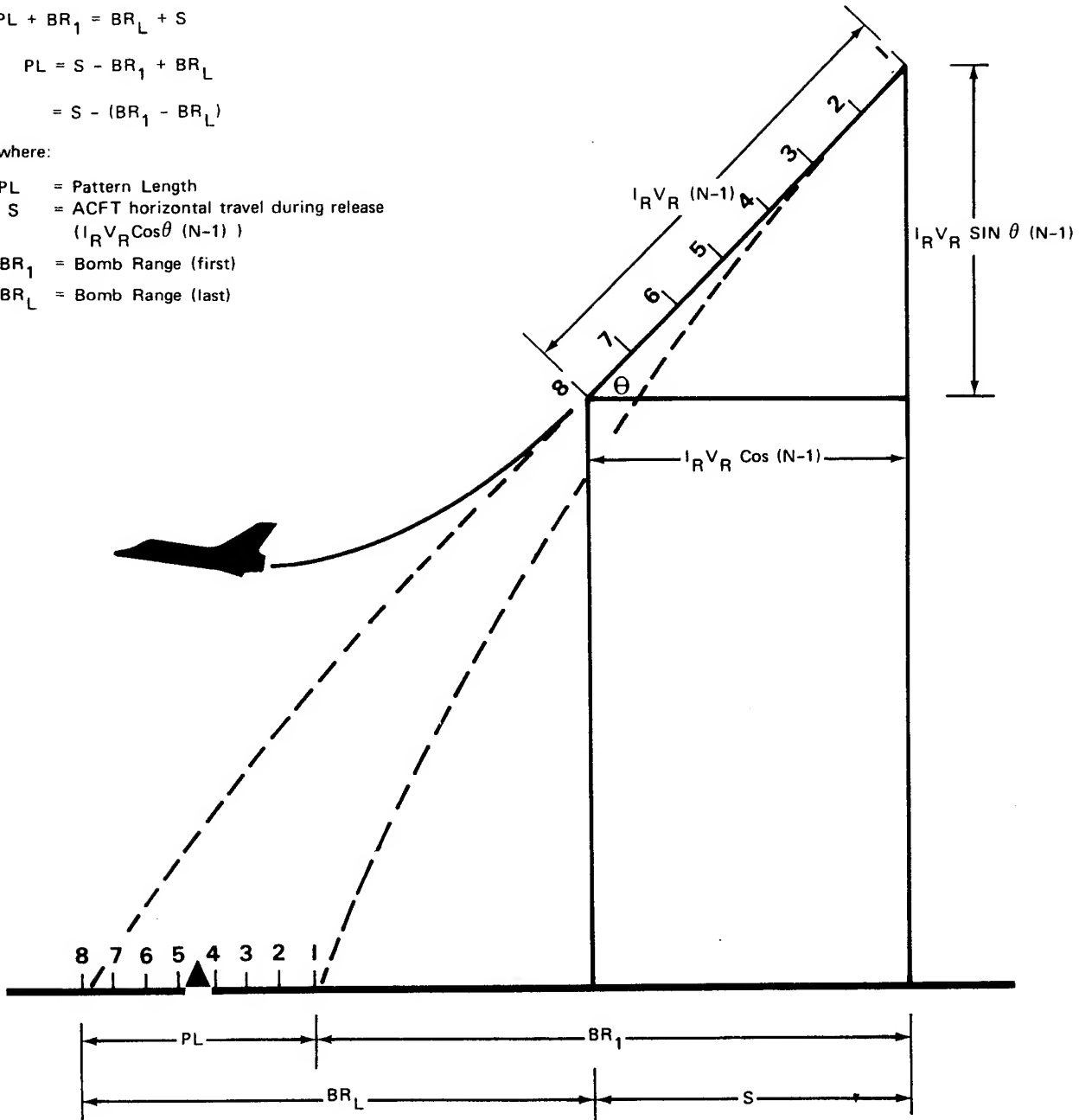


Figure 5-6

## Aim-off Distance Chart – 45° Dive

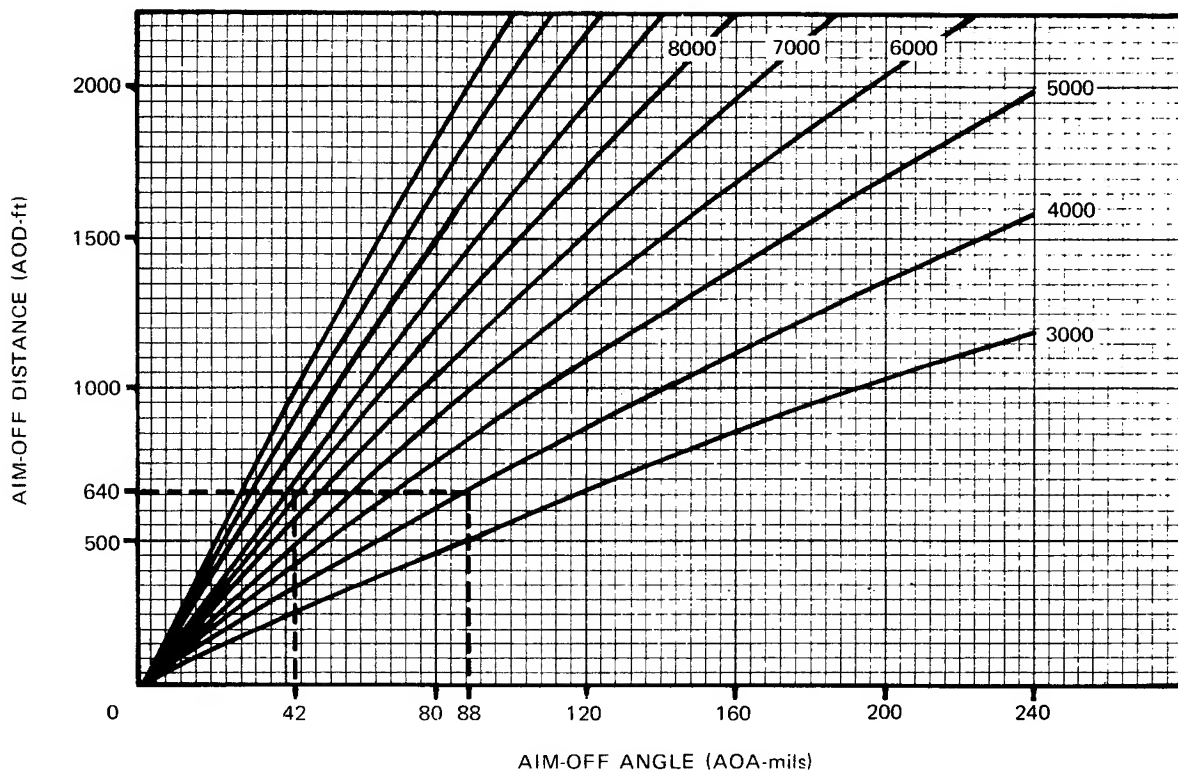


Figure 5-7

The initial pipper placement can be determined by calculation or by using the aim-off distance charts. The methods shown can also be used to calculate a check sight picture at any altitude above release to assist final tracking adjustments.

### Initial Pipper Placement—Nil Wind

Assume the planned release is a 45° dive, 4000 ft AGL and 480 KTAS. The aircraft angle of incidence at release is 32 mils and the aim-off angle is 88 mils, ie the sight setting is 120 mils. The planned roll out parameters are 360 KIAS at 8000 ft. The initial sight placement is calculated using Aim-off Distance Charts as follows :

- Determine the aircraft angle of incidence at roll out using the appropriate Incidence Chart :  
Angle of incidence at roll out = 40 mils.
- Subtract the angle of incidence at roll-out from the sighting angle to obtain the effective aim-off angle at roll-out :  
Effective Aim-off Angle =  $120 - 40$   
= 80 mils.
- Using the 45° Aim-off Distance Chart (refer to Fig 5-7), enter with the release aim-off angle (88 mils), proceed vertically to the release altitude (4000 ft AGL) then horizontally to the predicted

roll-out altitude (8000 ft AGL). Proceed down to determine the aim-off angle at roll-out that subtends the release aim-off distance :

Aim-off Angle = 42 mils.

- Subtract the aim-off angle at roll-out that subtends the release aim-off distance from the effective aim-off angle at roll-out obtained at para b. to obtain the pipper position at roll-out :

Pipper Position =  $80 - 42$   
= 38 mils.

A positive answer indicates mils below the target and vice versa. The geometrical relationships are shown in Fig 5-8.

### GUNNERY SIGHTING CALCULATION

Ballistic Tables are not available for the 30 mm Defa gun. The sight depression for air-to-ground gunnery (refer to Fig 5-9) is obtained by the addition of :

- trajectory shift in mil,
- gravity drop in mil,
- parallax factor in mil, and
- the difference between G/R/M zero sight line and the MFBL.

The following calculation determines the sight depression for 15° air-to-ground gunnery, firing at 450 KIAS from 600 metres (1970 ft). Aircraft config-

## Initial Pipper Placement

- A = 120 mils  
 B = 40 mils  
 C = 80 mils Effective AOA at roll out  
 D = 42 mils  
 E = Sight placement 38 mils below target (80-42)  
 F = 120 mils  
 G = 32 mils  
 H = 88 mils

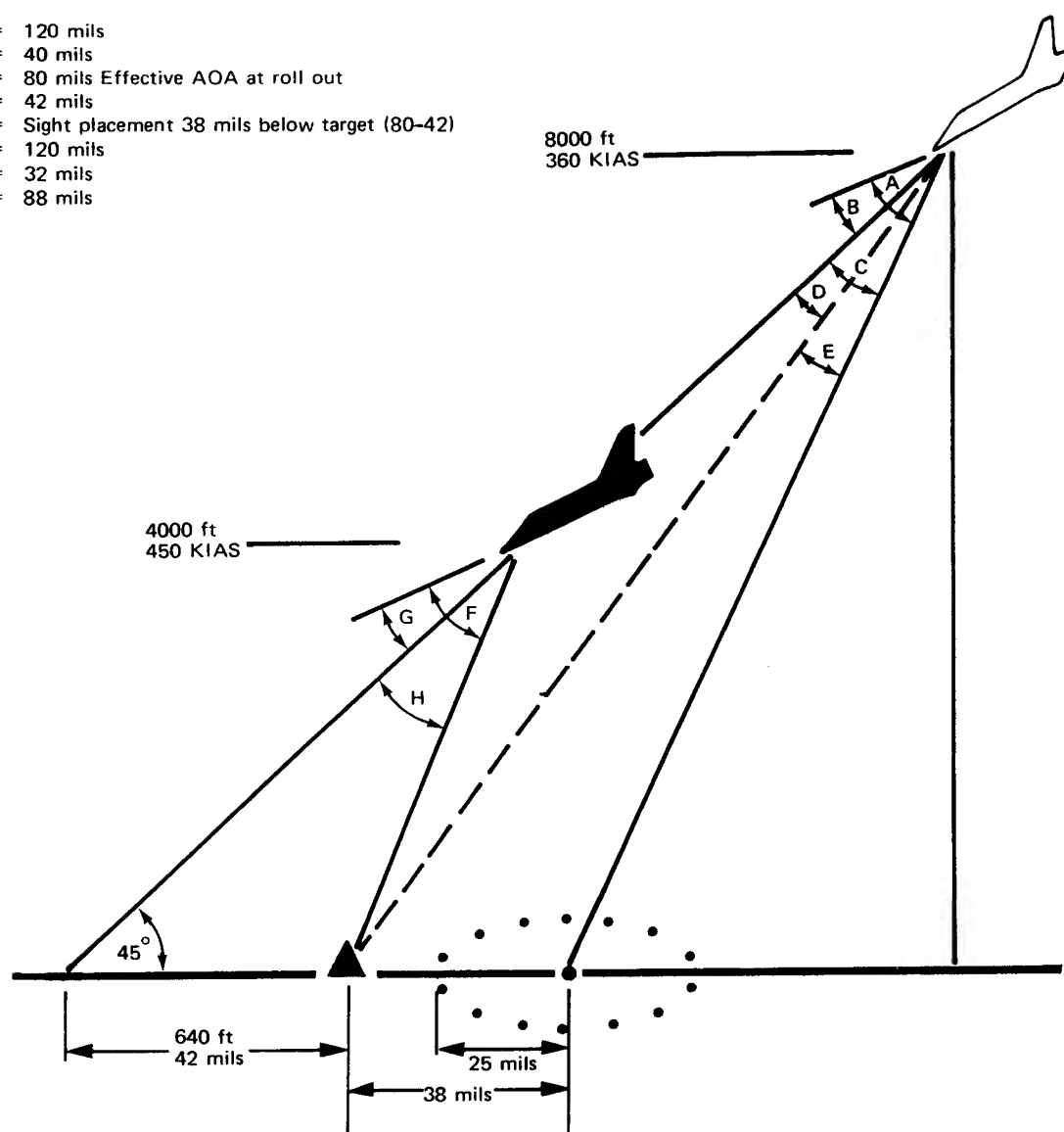


Figure 5-8

uration results in a weight of 8980 kg (19 800 lb) and CG of 51.5% (refer to Balance Chart). Angle of incidence is calculated to be 45 mil (Incidence Chart).

### Trajectory Shift

To calculate the trajectory shift use the formula :

$$\text{Trajectory Shift} = \frac{V_f \times AG}{V_f + V_m}$$

where AG = angle of gunfire (mils), determined by subtracting the gun depression angle (26.5) from the true incidence (AA),

$V_f$  = flight velocity (ft/sec), and

$V_m$  = muzzle velocity (ft/sec).

$$\begin{aligned}
 \text{Trajectory Shift} &= \frac{760 \times (AA - 26.5)}{760 + 2673} \\
 &= \frac{760 \times (45 - 26.5)}{760 + 2673} \\
 &= 4.1 \text{ mil.}
 \end{aligned}$$

### Gravity Drop

From the Gravity Drop Chart (refer Fig 6-63) using the above release parameters, extract the gravity drop :

Gravity drop = 3.8 mil.

### Parallax Correction

Parallax correction depends on the firing range, in

## Air-to-Ground Gunnery

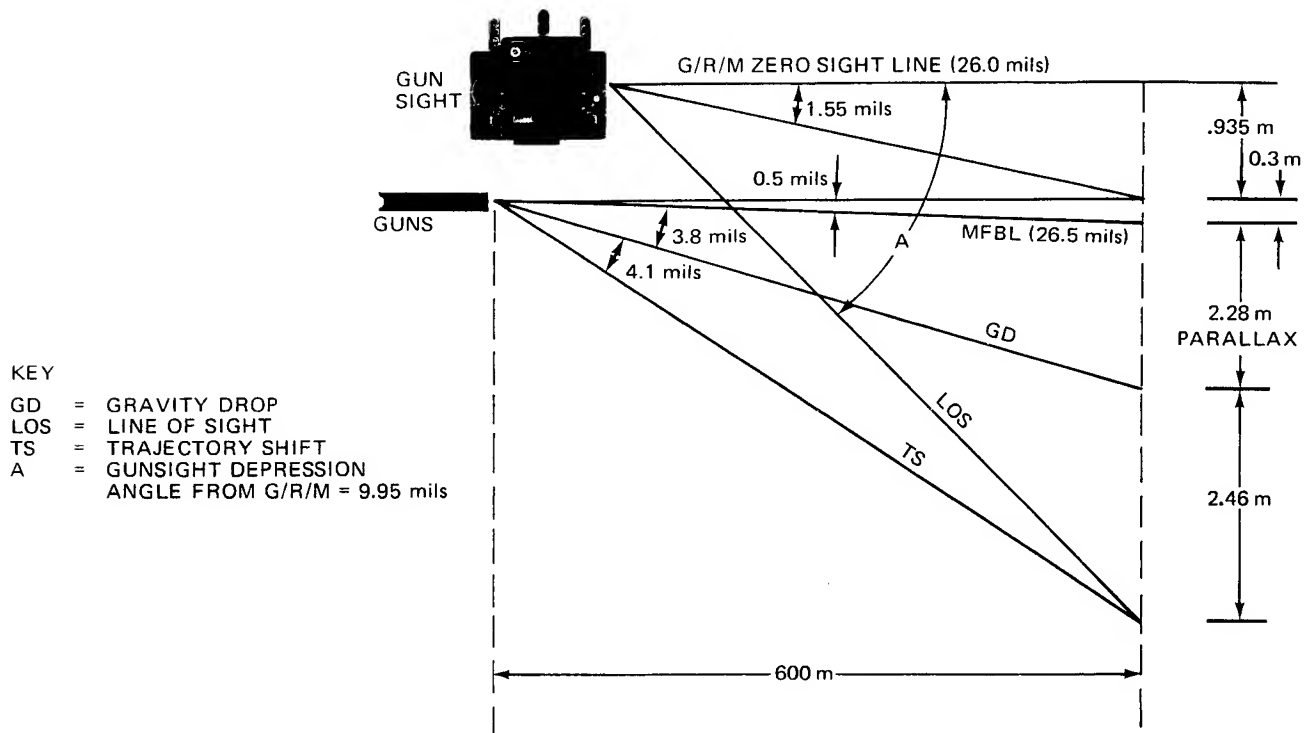


Figure 5-9

this case 600 metres (1970 ft). To find the parallax correction at this range, the distance the gunsight is above the guns is multiplied by 1000 and then divided by the range. The resultant parallax correction is :

$$\text{Parallax Correction} = \frac{0.935 \times 1000}{600}$$

$$= 1.55 \text{ mils}$$

### Sight Depression — G/R/M

To obtain the sight depression in G/R/M, add trajectory shift, gravity drop, parallax and difference between G/R/M zero sight line and MFB (0.5 mil) :

$$\text{Sight Depression G/R/M} = 4.1 + 3.8 + 1.55 + 0.5$$

$$= 9.95 \text{ mils}$$

### High Angle Sighting Calculation

The high angle sighting calculation is derived in exactly the same manner as for low sighting angle, however the dive angle does start to affect gravity drop figures when dive angles in excess of 20° are planned. With dive angles in excess of 20°, the gravity drop is equal to the level flight gravity drop multiplied by the cosine of the dive angle.

### TOSS BOMBING

The toss bombing problem is illustrated in Figure 5-10. To compute the toss bombing parameters :

- select the delivery sequence conditions,
- determine the bomb range from the ballistic tables,
- determine the time/distance from the initial point (IP) to the pull-up-point (PUP), and
- apply wind correction factors.

### Selection of Delivery Sequence Conditions

The delivery sequence is initiated at the PUP. When calculating a run-in TAS, consideration must be given to excess thrust available, so that a specific release TAS can be achieved following a 4'g' rotation and climb. Normally, the run-in TAS equals the release TAS, as IAS decreases in the climb at about 1 kn/60 KTAS/1000 ft (to maintain a constant TAS). For example, for a run-in TAS of 540 kn, the IAS decreases at about 9 kn/1000 ft of climb to maintain 540 KTAS. To minimise this error, the bomb is to be released as soon as possible after the PUP with the aircraft stabilized at the required climb angle. The altimeter lag and pressure error must also be taken into account during calculations.



## Toss Bombing

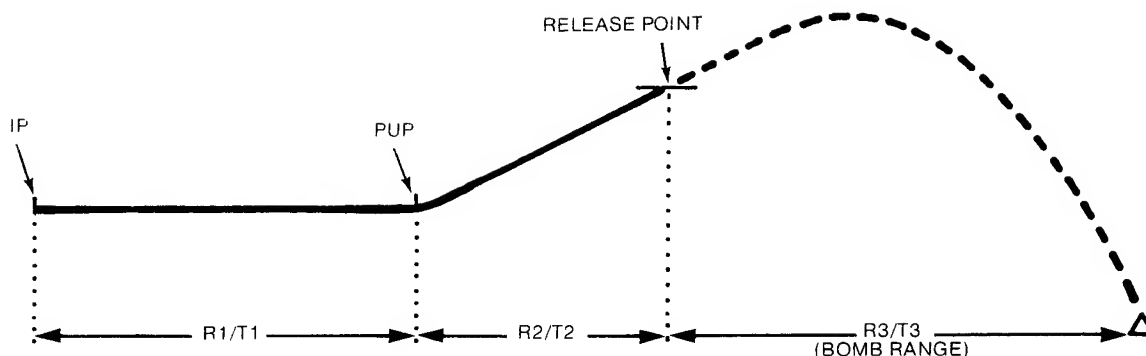


Figure 5-10

### Calculation of Pull-up Point

- a. Calculate the distance from the PUP to the target as follows :

$$\text{Distance (PUP to Target)} = R2 + R3$$

$$= \frac{V_{ri}^2 \sin C}{33.87} - \frac{(1 - \cos C)}{\tan C} + \frac{H_{rel} - H_{ri}}{\tan C} + R3$$

where :

R2 = Distance (PUP to release point)

R3 = Bomb range (BR) (ft)

V<sub>ri</sub> = Run-in KIAS

C = Climb angle

H<sub>rel</sub> = Release height (ft)

H<sub>ri</sub> = Run-in height (ft)

- b. Calculate the distance from IP to PUP as follows :

Distance (IP to PUP)

= (IP to target) - (PUP to target) Distance

= (IP to target) Distance - (R2 + R3) ft.

- c. Calculate the time from IP to PUP as follows :

$$\text{Time (IP to PUP)} = T1 = \frac{R1}{V_{ri} \times 1.69} \text{ sec}$$

### Wind Correction

Wind effect must be taken into account when considering the bomb trajectory from release point to target, and the aircraft run-in from IP to release point.

Wind corrections are made in two ways. Firstly, a forecast target area wind is applied to (R2 + R3) to move the PUP (and hence alter R1/T1) into wind. A forecast crosswind is also applied to achieve a cross track offset for the run-in leg from the IP. Secondly, as calculations are based on TAS, the wind effect is measured from Doppler groundspeed/actual TAS comparison to T1 so the planned PUP is achieved. The second correction is termed the Time Correction Factor (TCF) and is expressed in sec/kn. The TCF is applied to T1 when running in from the IP to ensure pull-up occurs at the correct PUP. However, using an actual ground feature is the most accurate method of denoting a PUP.

### Wind Correction Computation

- a. **Rangewind.** A Range Correction Factor (RCF) is used to move that portion of the delivery from PUP to bomb impact into wind by a distance equal to the airmass movement during this time (T2 + T3). The altitude used for RCF calculations is twice the release altitude minus the run-in altitude.

$$\begin{aligned} \text{RCF} &= (\text{TOF}) + \text{Time (PUP to Release)} \times 1.69 \\ &= (T3 + T2) \times 1.69 \end{aligned}$$

where :

TOF = The time of flight of the bomb from release to impact = T3

The answer is expressed in ft/kn and is then multiplied by the Rangewind component of the wind velocity. The range correction is then applied to the nil wind R1 using the 'HATS' rule of thumb: Headwind, add/Tailwind, subtract.

ie: Corrected R1

$$= R1 (\text{nil wind}) \pm (RCF \times \text{Rangewind velocity})$$

- b. **Crosswind.** A Cross Track Offset (CTO) is used to compensate for the crosswind effect of the bomb after release.

$$\text{Crosswind aimpoint} = \text{TOF} \times 1.69 (\text{ft/kn})$$

$$\text{CTO} = \text{Crosswind Aimpoint} - \frac{BR}{TAS \times \cos C} (\text{ft/kn})$$

$$\text{CTO} = (T3 \times 1.69 - \frac{R3}{TAS \times \cos C}) (\text{ft/kn})$$

(The run-in TAS and release TAS should be equal)  
Actual offset (ft) = CTO  $\times$  Crosswind velocity

- c. **Run-in Wind Correction.** A Time Correction factor (TCF) must be calculated to modify T1 as wind affects the run-in groundspeed (the TAS is constant). The TCF is calculated prior to the mission and applied after leaving the IP when the Doppler groundspeed is known.

$$\text{TCF} = \frac{T1}{TAS} (\text{sec/kn})$$

The TCF is multiplied by the difference between TAS and groundspeed and is then applied to T1 according to the 'HATS' rule of thumb.

$$\text{ie: Corrected T1} = T1 \pm (\text{TCF} \times \Delta W)$$

where :

$\Delta W$  = difference between GS and TAS in kn.

#### Note

The TCF only modifies T1 and does not allow for wind effect after the PUP. In addition to allowing a cross track offset distance, Doppler drift must be also applied to the run-in heading flown from the IP.

#### Sample Toss Bombing Calculation

The following sample toss bombing calculation assumes :

- Run-in TAS = Release TAS = 575 KTAS
- All heights above target elevation.
- Tail wind component = 3 kn.
- Crosswind component = 24 kn.
- Climb angle =  $30^\circ$ .
- Release height = 1500 ft.
- Run-in height = 500 ft
- 4'g' rotation to climb angle.

To determine the PUP and wind correction factors, proceed as follows :

- a. Determine PUP to target distance :

$$\text{PUP to target distance} = R2 + R3$$

$$= \frac{V_{ri}^2}{33.87} \left[ \sin C - \frac{(1 - \cos C)}{\tan C} \right] + \frac{H_{rel} - H_{ri} + BR}{\tan C}$$

From the ballistic tables, BR is 24 054 ft

$$R2 + R3 = 28 402 \text{ ft}$$

- b. Determine IP to PUP distance :

IP to PUP distance

$$= (\text{IP to target} - \text{PUP to target}) \text{ Distance.}$$

(Assume IP to target distance is 43 296 ft)

$$= 43 296 - (R2 + R3)$$

$$R1 = 14 894 \text{ ft}$$

- c. Determine IP to PUP Time :

$$\text{IP to PUP Time (T1)} = \frac{R1}{V_{ri} \times 1.69}$$

$$= 15 \text{ secs}$$

- d. Determine Range Correction Factor :

$$\text{Range Correction Factor (RCF)} = (T3 + T2) \times 1.69$$

where :

From ballistic tables T3 (TOF) is 31.8 sec, and

$$T2 \text{ is represented by the formula } \frac{R2}{\cos C \times V_{ri} \times 1.69}$$

$$= 31.8 + T2$$

$$= 62 \text{ ft/kn}$$

- e. Determine corrected R1 :

As previously discussed, RCF is applied to the nil wind R1 to give the corrected R1 :

Corrected R1 at 3 kn tailwind)

$$= R1 (\text{nilwind}) - (62 \times 3)$$

$$= 14 708 \text{ ft}$$

- f. From the formula :

$$\text{Cross Track Offset (CTO)} = 5.4 \text{ ft/kn}$$

Actual offset (24 kn crosswind component)

$$= 130 \text{ ft}$$

- g. Finally, a Time Correction Factor (TCF) is found and applied to T1.

$$\text{TCF} = \frac{T1}{TAS}$$

$$= 0.03 \text{ sec/kn}$$

When airborne, the TCF is applied to modify T1 using the formula :

$$\text{Corrected T1} = T1 \pm (0.03 \times \Delta W)$$

It can be seen that  $\Delta W$  has to be quite large to alter T1 in this example.



**SECTION 6**  
**PLANNING CHARTS AND TABLES**

## SECTION 6

## PLANNING CHARTS AND TABLES

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Table of Basic Weights, Store Weights and Drag Indexes	6-2	Bomb Ballistics Tables	6-3



## SECTION 6

# PLANNING CHARTS AND TABLES

### CONVERSION CHARTS

The airspeed Conversion Chart (refer to Fig 6-1) represents the relationship of indicated airspeed, true airspeed and true Mach number as a function of outside air temperature in degrees Celsius and true pressure altitude. If the true pressure altitude at release is not available, the release altitude AMSL may be used.

#### Note

Indicated airspeed (IAS) and calibrated airspeed (CAS) are considered to be equal, therefore position error correction is not required.

The density altitude to pressure altitude, knots to feet per second, feet to metres and temperature conversion charts are presented in Fig 6-2 as supplementary information.

### ALTIMETER LAG CHART

During a dive, the altimeter does not unwind at a rate equal to the actual rate of aircraft descent. The altimeter lag chart (refer to Fig 6-3) shows the altitude that must be added to obtain an indicated release altitude above ground level.

### PRESSURE ERROR CORRECTION CHART

The pressure error correction chart for the Smiths 3B altimeter installation is not yet available. It will be issued at a later date.

The pressure error correction chart (refer to Fig 6-4) relates to the three pointer altimeter installation. To ensure flight at the intended true altitude, the sum of the indicated altitude and the pressure error correction must equal the intended true altitude. If the pressure error is +100 feet, fly at an indicated altitude 100 feet lower than the intended true altitude.

### MAXIMUM FRAGMENTATION ENVELOPE CHART

The Maximum Fragmentation Envelope Chart for MK82 GP bombs (refer to Fig 6-6) shows the fragmentation position relative to the weapon burst point as a function of time, and is used in determining the safe release height or the interval between aircraft during multiple release attacks. The chart is based on the assumption that the most hazardous fragment, ie the heaviest fragment with the maximum velocity, can be projected from the burst point at any angle, irrespective of weapon delivery conditions.

### FUSE ARMING TABLES

Fuse arming distance is the vertical distance below the aircraft where the fuse will be unarmed. If bomb

impact occurs within the arming distance, the bomb will not explode.

### WARNING

The bomb release conditions provided in the Ballistic Tables in this manual must be checked with the Fuse Arming Tables (refer to Fig 6-7 to 6-9), Safe Escape Tables (refer to Fig 6-11 and 6-12) and the Dive Recovery Charts (refer to Fig 6-14 to 6-17) to ensure a safe and successful delivery condition.

The bomb fuse arming tables provide the minimum release altitude or vertical drop required for the arming of M904 E2, M904 E3 and M905 fuses. The data is provided for arming delays of 4, 6 and 8 seconds and for dive angles of 0° to 60° in 15° increments. Current tolerances on arming delays are shown in the charts. The delay setting plus the positive tolerance is used in the determination of the minimum release altitude or vertical drop required for fuse arming.

### EXPOSURE TIME TABLE

The Exposure Time Table (refer to Fig 6-13) provides altitude lost during pull out from a 45° dive releasing at 7000 ft for both 4 'g' and 5 'g' recoveries. Exposure time in seconds is tabled for the specific roll in and recovery parameters indicated.

### DIVE RECOVERY CHARTS AND TABLES

The Dive Recovery Charts (refer to Fig 6-14, 15 and 16) are used to determine the altitude lost during pullout after bomb release. The charts are based on an acceleration of 3.0 'g', 4.0 'g' or 5.0 'g' obtained in 2 seconds after release. For conditions when CL max is reached, the curves follow the buffet boundary. Enter the chart with release velocity TAS, project up to the dive angle then across to read altitude lost. Release altitude must be greater than the sum of altitude lost during pull out and minimum recovery altitude. These charts contain no reaction time and no safety factors. The Banked Turn Pull-out Tables (refer to Fig 6-17) give the altitude lost during pull outs using various bank angles. The tables are based on the same assumptions as the Dive Recovery Charts.

### VERTICAL/HORIZONTAL COMPONENT CHART

This chart (refer to Fig 6-18) gives the vertical and horizontal components of aircraft velocity in ft/sec, for various dive angles. It is based on aircraft velocity in ft/sec = TAS in kn  $\times$  1.69. Enter the chart at the dive angle and TAS point and project horizontally to

read the vertical velocity or vertically down to read the horizontal velocity in ft/sec.

#### DIVE ANGLE VS DISTANCE CHART

The Dive Angle Vs Distance Chart (refer to Fig 6-19) provides a means of determining the distance from the target for a given dive angle and altitude, and also the slant range. Aim-off distance can also be computed. To determine the aim-off distance, place a mark on the chart at the intersection of release altitude and dive angle, then project down and read off the distance from the target. Subtract the bomb range (from the Ballistics Tables) from this distance to obtain the aim-off distance. This chart is provided as supplementary data and is not used in the sample problem.

#### RELATIVE WIND VECTOR CHART

When forecast wind data is used for mission planning, the Relative Wind Vector Chart (refer to Fig 6-20) is used to obtain the rangewind and crosswind components. The wind velocity at release altitude should be used. The deflection of the bomb is a function of initial velocity and time of flight. As the time of flight becomes less, the magnitude of deflection is also less. Relative wind direction must be determined before entering the relative wind vector chart.

Given that the forecast wind velocity is  $350^\circ/30$  kn and the approach heading to the target is  $040^\circ T$ , use the relative wind vector to find the rangewind and crosswind components. To obtain the relative wind direction, subtract the approach heading to the target from the forecast wind direction over the target, ie  $350^\circ - 40^\circ = 310^\circ$  relative wind direction. If the value of the aircraft heading to the target is greater than the value of the wind direction, add  $360^\circ$  to the wind direction then subtract the aircraft heading from the wind direction to obtain the relative wind direction. Enter the relative wind vector chart with the relative wind,  $310^\circ$ . Project to the 30 kn wind velocity circle then to the horizontal and vertical axes. The components are :

- rangewind component—20 kn, and
- crosswind component—23 kn.

#### TABLE OF BASIC WEIGHTS, STORE WEIGHTS AND DRAG INDEX

Figure 6-21 includes the basic weights, store weights and drag index for both versions of the aircraft. To use the table :

- Determine the aircraft configuration and note the various entries of equipment weight, fuel weight and drag index for the associated equipment entries that collectively make up the current configuration.
- Total the noted equipment weights (W1).
- Total the noted fuel weights (W2).
- Determine the AUW -  $W1 + W2$ .
- Total the noted drag index figures.

#### BALANCE CHARTS

The Balance Charts (refer to Fig 6-22 to 6-27) are used to calculate the position of the CG at a planned weight and a given aircraft configuration. The position of the CG is expressed as a percentage of the mean aerodynamic chord and is used for calculating the angle of incidence from the Incidence Chart. Select the chart which represents the planned aircraft configuration. Enter the chart with the gross weight or the fuel remaining for the configuration and project horizontally to the configuration reference line. Then parallel the factor slope line to the CG percentage figure.

#### INCIDENCE CHARTS

The incidence charts (refer to Fig 6-28 and 6-29) are used to determine the aircraft fuselage angle of incidence. Enter the chart at the planned pressure altitude at release and move vertically to the planned calculated CAS at release. From the CAS line, move horizontally to the gross weight line and thence vertically down to the dive angle reference line. From the dive angle reference, move horizontally to the reference line and thence parallel the guide lines to the calculated projection of %CG. From this position a horizontal projection to the appropriate configuration reference line enables a direct reading of incidence in mil from the base scale of the chart.

#### AIM-OFF ANGLE CHARTS

The aim-off angle charts (refer to Fig 6-30 to 6-43) are used to determine the aim-off angle in mils (ie the sight depression from flight path) for a specific bombing altitude and bomb range. To determine aim-off angle enter the chart with bomb range, move horizontally to the release altitude above the target then down vertically to read aim-off angle.

#### AIM-OFF DISTANCE CHARTS

The Aim-off Distance Charts (refer to Fig 6-44 to 6-54) are used to obtain an aim-off distance when the release altitude and aim-off angle are known. To find aim-off distance enter the appropriate chart with the aim-off angle obtained from the ballistics tables, move vertically to the release altitude then horizontally left to read the appropriate aim-off distance. These charts are independent of ballistics or parallax and relate only to the appropriate geometrical relation from the sight as shown in Figure 6-55.

#### PARALLAX CORRECTION TABLE

The parallax correction table (refer to Fig 6-56) provides the horizontal and vertical sight parallax correction components for dive angles up to  $60^\circ$ . The distances in the table are illustrated in Figure 5-1, The Dive Bomb Problem. The table applies to bombs on PM-3 or RPK10.

#### BOMB SPACING CHARTS

The bomb spacing charts (refer to Fig 6-57 and 6-58) provide the bomb impact spacing for various release



altitudes and bomb release intervals. The charts are valid for diving releases at normal release speeds. The charts are valid for all low-drag weapons including finned fire bombs.

To obtain the bomb impact spacing, enter the appropriate chart at the dive angle and project vertically to the release altitude then horizontally to the 550 kn release line. Parallel the appropriate guide line to the release TAS then move horizontally left to the 300 millisecond bomb release interval line. Parallel the appropriate guide line to the bomb release interval then move horizontally left to read the impact spacing between bombs.

#### **ERROR ANALYSIS TABLES**

Error analysis tables (refer to Fig 6-59 to 6-62) for low and high-drag BDU-33 practice bombs and low and high-drag MK82 bombs are to be issued. The tables will cover the following errors at various dive angles :

- a. release altitude error,
- b. release TAS error,
- c. dive angle error, and
- d. 'g' error at release.

#### **DEFA GRAVITY DROP CHART**

The Defa Gravity Chart (refer to Fig 6-63) has been constructed on the assumption that the muzzle velocity of the 30 mm Defa gun is 815 m/sec. It measures the gravity drop, in mils, of the 30 mm projectile fire at sea level.

The graph is used for calculating the sighting angle required when using the guns against a ground target. The gravity drop, added to the trajectory shift and parallax figures (all in mils) combine to give the sighting angle. A sample problem appears later in the section.

Dive angles up to 20° have little effect on gravity drop. Above 20°, the gravity drop is equal to the level flight gravity drop  $\times$  cosine of the dive angle.

Enter the chart with the slant range to the target (metres), project horizontally to the release true airspeed reference line, then project vertically to read the gravity drop in mils.

#### **SIGHT DEPRESSION CHART — AIR-TO-GROUND GUNS**

The Sight Depression Chart (refer to Fig 6-64) for air-to-ground gunnery can be used for determining the sight depression when the firing parameters are within the assumptions indicated on the chart.

Enter at the planned firing range and move horizontally to the planned firing IAS. The sight depression is read directly from the body of the graph.

#### **BOMB BALLISTICS TABLES**

The bomb ballistics tables are entered with the release conditions of true airspeed, altitude above target and dive angle. The following information is available :

- a. Time of fall of the bomb in seconds.
- b. Bomb range in feet.
- c. Slant range from release to bomb impact in feet.
- d. Aim-off angle (sight depression from flight path) in mils. Aircraft angle of incidence must be added to obtain the sighting angle.
- e. Bomb impact angle (high-drag only).
- f. Wind correction factors.

The aim-off angle data presented in the bomb ballistics tables is corrected for sight parallax and is therefore related to the sight. The bomb range and bomb slant range are measured from the mean bomb position.

#### **Interpolation of Ballistic Tables**

When it is necessary to interpolate the ballistic tables, the following review may be helpful. Assume that the sight depression is to be interpolated for 420 KTAS :

Sight Depression at 400 kn = 15.4 mils  
Sight Depression at 450 kn = 13.7 mils  
Difference = 1.7 mils

Proceed to establish sight depression differences at 450 kn and 420 kn :

$$\begin{aligned} \text{Difference} &= \frac{450 \text{ kn} - 420 \text{ kn}}{450 \text{ kn} - 400 \text{ kn}} \times 1.7 \\ &= \frac{30}{50} \times 1.7 \\ &= 1.02 \text{ mils} \end{aligned}$$

Add difference to sight depression at 450 kn.

$$= 1.02 + 13.7$$

$\therefore$  Sight Depression at 420 kn = 14.7 mils.

#### **Note**

Figures are examples only.

# Airspeed Conversion Chart

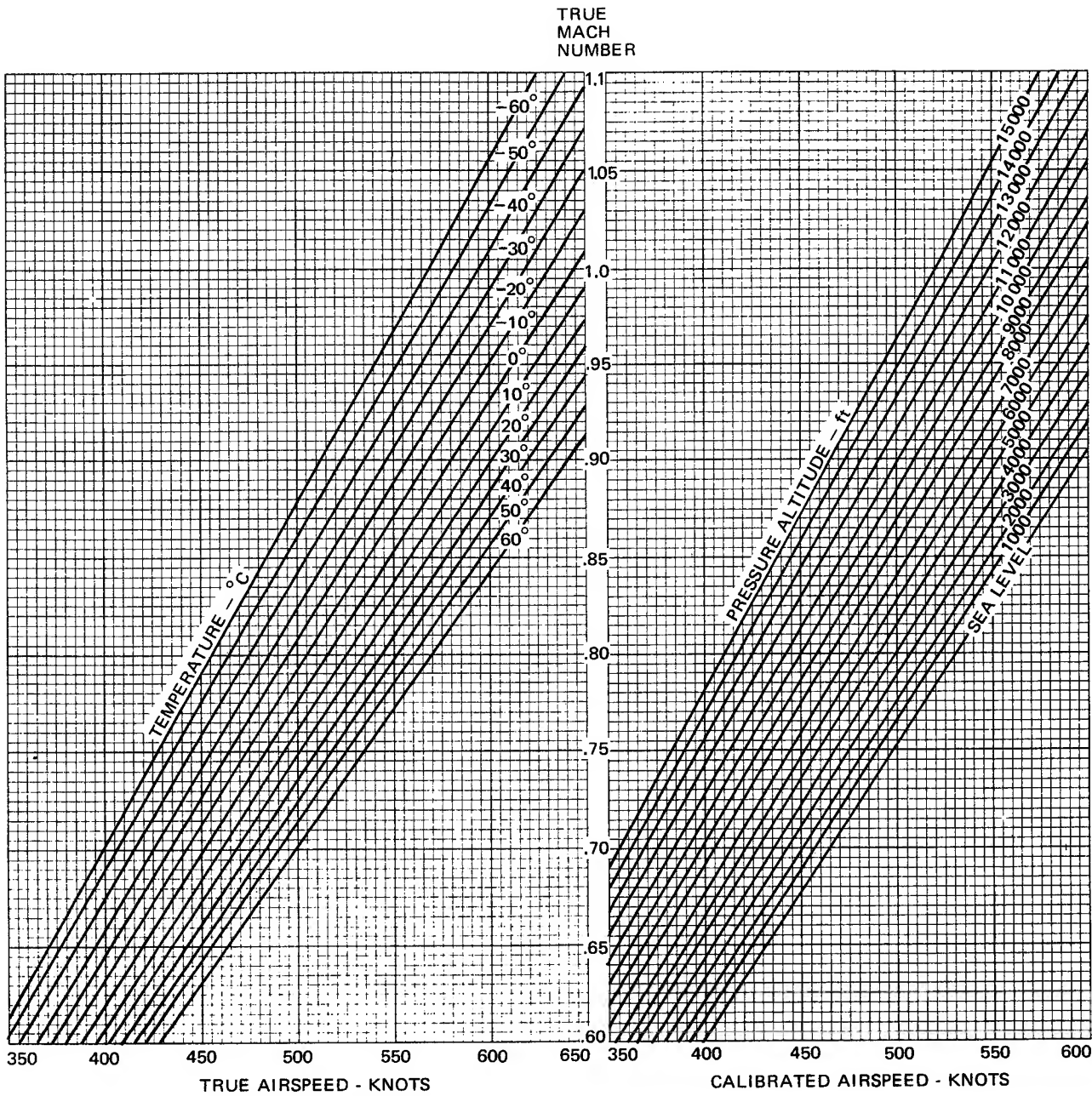
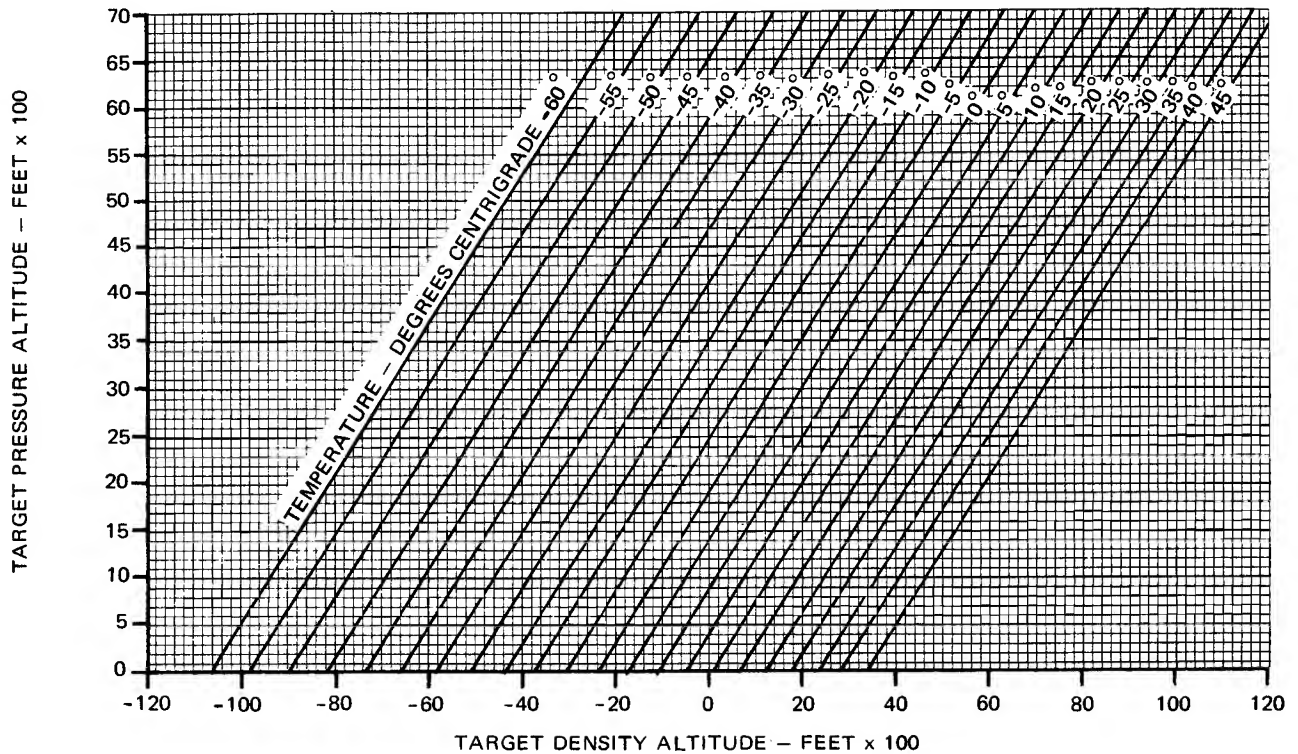


Figure 6-1

# Conversion Chart

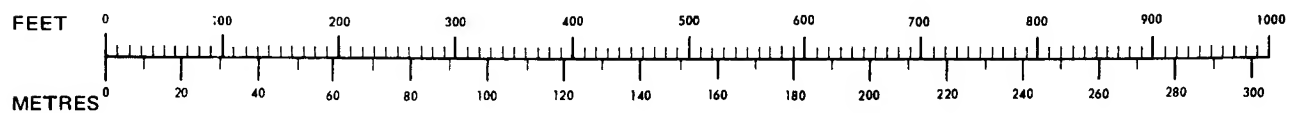
## DENSITY ALTITUDE TO PRESSURE ALTITUDE



## FEET/SECONDS TO KNOTS



## FEET TO METRES



## TEMPERATURE CONVERSION

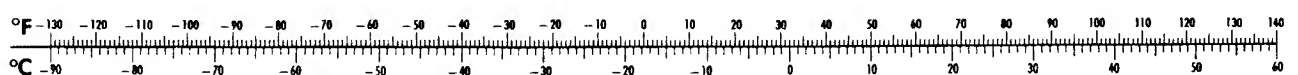


Figure 6-2

# Altimeter Lag Chart

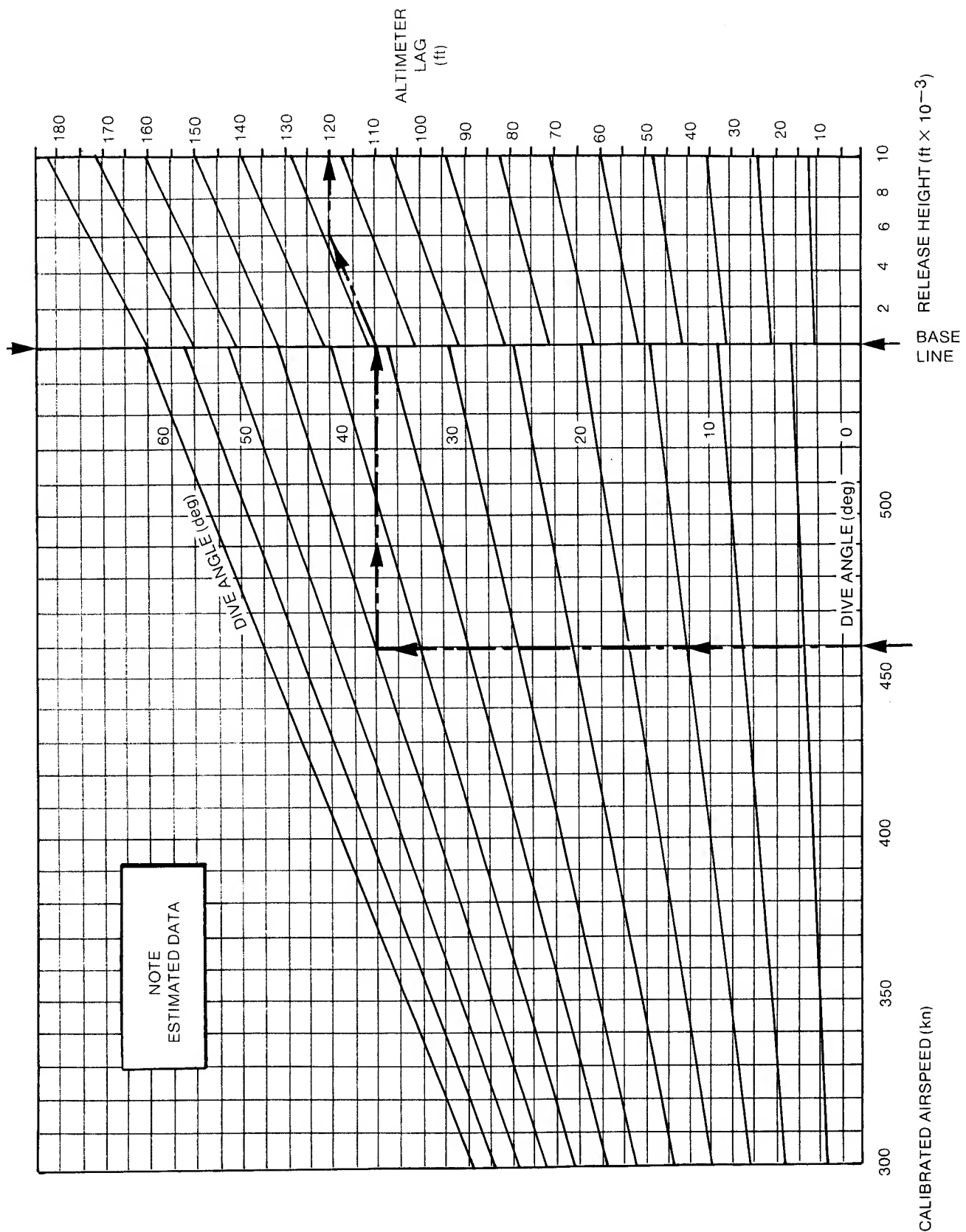


Figure 6-3

## Pressure Error Correction — Altitude Chart III O

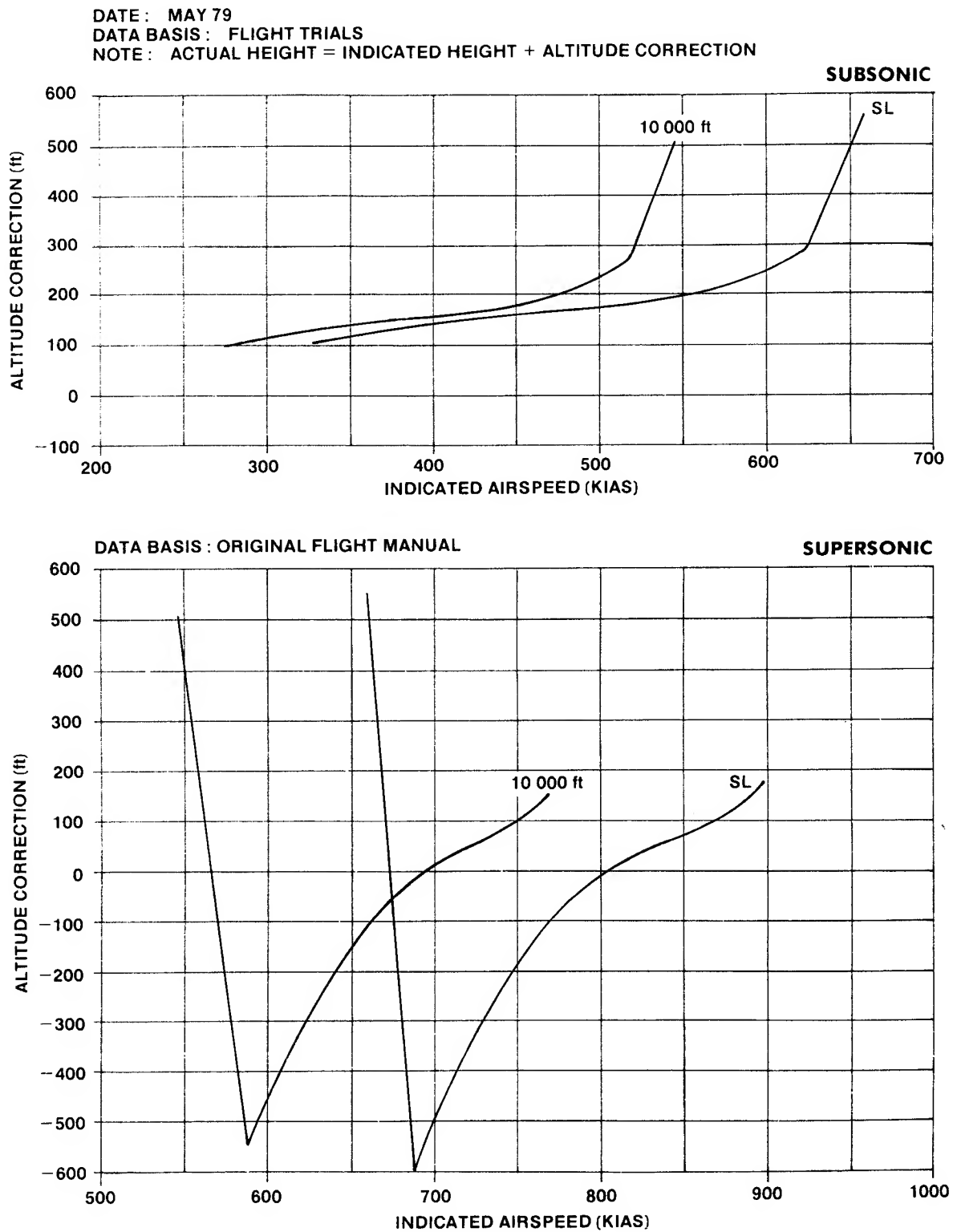


Figure 6-4

**RESERVED**

***Figure 6-5***

# Maximum Fragmentation Envelope – MK82 GP Bombs

SOURCE : F111A Munitions Delivery Manual

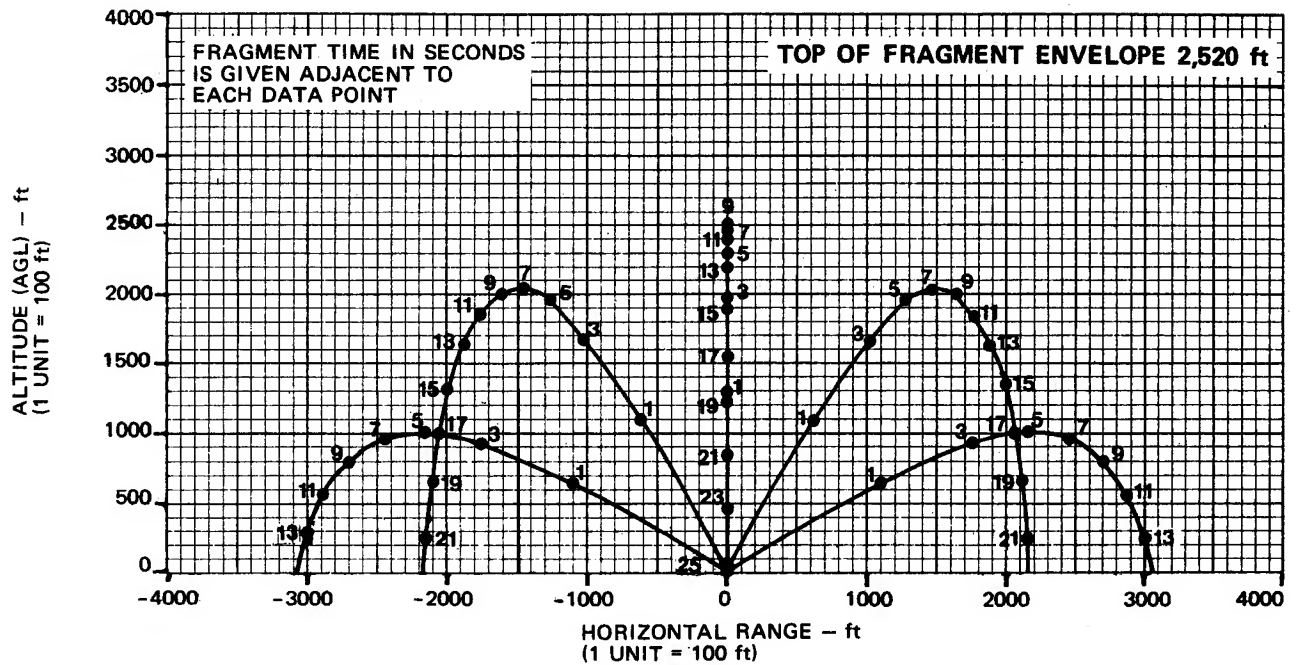


Figure 6-6

## Fuse Arming Table — M904E2 Fuse

SOURCE: 1CAMD

## 4 SECOND DELAY

KTAS DIVE ANGLE	400	420	440	460	480	500	520	540	560	580	600
0	370	370	370	370	370	370	370	370	370	370	370
15	1210	1250	1300	1340	1380	1420	1460	1510	1550	1590	1630
30	1990	2080	2160	2240	2320	2400	2480	2560	2640	2720	2810
40	2460	2560	2670	2770	2870	2980	3080	3190	3290	3400	3500
45	2670	2780	2900	3010	3130	3240	3350	3470	3580	3700	3810
50	2860	2980	3110	3230	3350	3480	3600	3730	3850	3980	4100
55	3030	3160	3300	3430	3560	3690	3830	3960	4090	4230	4360
60	3180	3320	3460	3600	3740	3880	4020	4160	4310	4450	4590

## 6 SECOND DELAY

0	830	830	830	830	830	830	830	830	830	830	830
15	2090	2160	2220	2280	2350	2410	2470	2530	2600	2660	2720
30	3270	3390	3510	3630	3750	3870	4000	4120	4240	4360	4480
40	3960	4120	4270	4430	4590	4740	4900	5060	5210	5370	5520
45	4270	4450	4620	4790	4960	5130	5310	5480	5650	5820	5990
50	4560	4750	4930	5230	5310	5490	5680	5860	6050	6240	6420
55	4820	5020	5220	5420	5620	5810	6010	6210	6410	6610	6810
60	5050	5260	5470	5680	5890	6100	6310	6520	6730	6940	7150

## 8 SECOND DELAY

0	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480
15	3160	3240	3330	3410	3490	3580	3660	3750	3830	3910	4000
30	4720	4880	5050	5210	5370	5530	5700	5860	6020	6180	6340
40	5650	5860	6070	6270	6480	6690	6900	7110	7320	7520	7730
45	6070	6290	6520	6750	6980	7210	7440	7670	7900	8130	8360
50	6450	6700	6940	7190	7440	7690	7940	8190	8430	8680	8930
55	6790	7060	7320	7590	7850	8120	8390	8650	8920	9180	9450
60	7100	7380	7660	7940	8220	8500	8780	9060	9340	9620	9900

## NOTE

This table gives the vertical drop in feet.  
Tolerances on the delay setting are  $\pm 20\%$ .

Figure 6-7



## Fuse Arming Table — M904E3 Fuse

SOURCE: 1CAMD

### 4 SECOND DELAY

KTAS DIVE ANGLE	400	420	440	460	480	500	520	540	560	580	600
0	310	310	310	310	310	310	310	310	310	310	310
15	1080	1120	1160	1200	1240	1280	1310	1350	1390	1430	1470
30	1800	1880	1950	2020	2100	2170	2250	2320	2400	2470	2540
40	2230	2320	2420	2510	2610	2700	2800	2890	2990	3090	3180
45	2420	2520	2630	2730	2840	2940	3050	3150	3260	3360	3470
50	2590	2710	2820	2930	3050	3160	3270	3390	3500	3620	3730
55	2750	2870	2990	3110	3240	3360	3480	3600	3720	3850	3970
60	2890	3020	3150	3280	3400	3530	3660	3790	3920	4050	4180

### 6 SECOND DELAY

0	700	700	700	700	700	700	700	700	700	700	700
15	1860	1910	1970	2030	2090	2140	2200	2260	2320	2380	2430
30	2930	3040	3150	3270	3380	3490	3600	3710	3820	3930	4050
40	3570	3710	3850	4000	4140	4280	4430	4570	4710	4860	5000
45	3850	4010	4170	4330	4490	4640	4800	4960	5120	5270	5430
50	4120	4290	4460	4630	4800	4970	5140	5310	5480	5650	5830
55	4350	4540	4720	4900	5080	5270	5450	5630	5820	6000	6180
60	4560	4760	4950	5140	5340	5530	5720	5910	6110	6300	6490

### 8 SECOND DELAY

0	1240	1240	1240	1240	1240	1240	1240	1240	1240	1240	1240
15	2780	2860	2940	3010	3090	3170	3240	3320	3400	3480	3550
30	4220	4370	4510	4660	4810	4960	5110	5260	5410	5550	5700
40	5070	5260	5450	5640	5830	6020	6210	6400	6590	6780	6980
45	5450	5660	5870	6080	6290	6500	6710	6920	7130	7340	7550
50	5800	6030	6250	6480	6710	6940	7160	7390	7620	7850	8080
55	6110	6360	6600	6840	7090	7330	7570	7820	8060	8310	8550
60	6390	6650	6910	7160	7420	7680	7940	8190	8450	8710	8970

**NOTE**

This table gives the vertical drop in feet.  
Tolerances on the delay setting are  $\pm 10\%$ .

**Figure 6-8**

## Fuse Arming Table – M905 Fuse

SOURCE: 1CAMD

### 4 SECOND DELAY

DIVE ANGLE \ KTAS	400	420	440	460	480	500	520	540	560	580	600
0	440	440	440	440	440	440	440	440	440	440	440
15	1350	1390	1440	1480	1530	1570	1620	1670	1710	1760	1800
30	2190	2280	2370	2460	2550	2630	2720	2810	2900	2980	3070
40	2700	2810	2920	3030	3150	3260	3370	3490	3600	3710	3820
45	2920	3050	3170	3290	3420	3540	3670	3790	3920	4040	4160
50	3130	3260	3400	3530	3670	3800	3940	4070	4210	4340	4470
55	3320	3460	3600	3750	3890	4030	4180	4320	4470	4610	4750
60	3480	3630	3780	3940	4090	4240	4390	4540	4700	4850	5000

### 6 SECOND DELAY

0	980	980	980	980	980	980	980	980	980	980	980
15	2340	2410	2480	2550	2620	2680	2750	2820	2890	2960	3020
30	3610	3740	3880	4010	4140	4270	4400	4540	4670	4800	4930
40	4370	4530	4700	4870	5040	5210	5380	5550	5720	5890	6060
45	4700	4890	5080	5260	5450	5640	5820	6010	6190	6380	6570
50	5010	5220	5420	5620	5820	6020	6230	6430	6630	6830	7030
55	5290	5510	5730	5940	6160	6370	6590	6810	7020	7240	7450
60	5540	5770	6000	6230	6450	6680	6910	7140	7370	7600	7820

### 8 SECOND DELAY

0	1740	1740	1740	1740	1740	1740	1740	1740	1740	1740	1740
15	3550	3640	3740	3830	3920	4010	4100	4190	4280	4370	4460
30	5250	5420	5600	5780	5950	6130	6300	6480	6650	6830	7000
40	6250	6480	6700	6930	7150	7380	7610	7830	8060	8280	8510
45	6700	6950	7200	7450	7700	7950	8190	8440	8690	8940	9190
50	7120	7390	7660	7920	8190	8460	8730	9000	9270	9540	9810
55	7490	7780	8070	8350	8640	8930	9220	9510	9790	10080	10370
60	7820	8120	8430	8730	9040	9340	9650	9950	10250	10560	10860

#### NOTE

This table gives the vertical drop in feet.  
Tolerances on the delay setting are  $\pm 30\%$ .

**Figure 6-9**

## ***Fuse Arming Table — FMU-54/B Fuse***

**TO BE ISSUED**

***Figure 6-10***

## Safe Escape Table — MK82 Low Drag Bomb

MINIMUM RISK RELEASE ALTITUDE												
KTAS DIVE ANGLE	400			420			440			460		
	RECOVERY 'g'			RECOVERY 'g'			RECOVERY 'g'			RECOVERY 'g'		
	4	5	6	4	5	6	4	5	6	4	5	6
0	640	580	580	640	580	580	580	580	520	580	520	520
5	1000	940	880	1000	880	880	1000	880	820	940	880	820
10	1300	1240	1120	1360	1240	1120	1360	1240	1120	1360	1240	1180
15	1660	1540	1420	1720	1540	1420	1720	1540	1480	1780	1600	1480
20	2020	1840	1720	2080	1840	1720	2080	1900	1780	2140	1960	1780
25	2380	2140	1960	2440	2200	2020	2500	2260	2080	2560	2320	2140
30	2680	2440	2260	2800	2500	2320	2860	2560	2380	2920	2620	2440
35	3040	2740	2500	3100	2800	2620	3220	2920	2680	3280	2980	2740
40	3340	3040	2800	3460	3100	2860	3580	3220	2980	3640	3280	3040
45	3640	3280	3040	3760	3400	3160	3880	3520	3220	4000	3640	3340
50	3940	3580	3280	4120	3700	3400	4240	3820	3520	4360	3940	3640

KTAS DIVE ANGLE	480			500			520			540		
	RECOVERY 'g'			RECOVERY 'g'			RECOVERY 'g'			RECOVERY 'g'		
	4	5	6	4	5	6	4	5	6	4	5	6
0	580	520	460	580	520	460	520	460	460	520	460	460
5	940	880	820	1000	880	820	1000	880	820	1000	880	820
10	1360	1240	1180	1360	1240	1180	1420	1300	1180	1420	1300	1180
15	1780	1600	1480	1780	1660	1540	1840	1660	1540	1840	1720	1600
20	2200	1960	1840	2200	2020	1900	2260	2080	1900	2320	2080	1960
25	2560	2380	2200	2620	2380	2260	2680	2440	2260	2740	2500	2320
30	2980	2680	2500	3040	2800	2560	3100	2860	2620	3160	2920	2680
35	3400	3040	2860	3480	3160	2920	3520	3220	2980	3580	3280	3040
40	3760	3400	3160	3820	3460	3220	3940	3580	3340	4000	3640	3400
45	4120	3700	3460	4240	3820	3520	4300	3940	3640	4420	4000	3700
50	4480	4060	3700	4600	4120	3820	4720	4240	3940	4840	4360	4060

Figure 6-11 (Sheet 1 of 2)

MINIMUM RISK RELEASE ALTITUDE									
DIVE ANGLE  KTAS	560			580			600		
	RECOVERY 'g'			RECOVERY 'g'			RECOVERY 'g'		
	4	5	6	4	5	6	4	5	6
0	520	460	460	520	460	460	520	460	460
5	1000	880	820	1000	880	820	940	880	820
10	1420	1300	1180	1420	1300	1240	1420	1300	1240
15	1900	1720	1600	1900	1720	1600	1900	1780	1660
20	2320	2140	2020	2380	2200	2020	2380	2200	2080
25	2800	2560	2380	2860	2620	2440	2860	2620	2440
30	3220	2980	2740	3280	3040	2800	3340	3040	2860
35	3700	3310	3100	3760	3400	3220	3820	3460	3280
40	4120	3760	3460	4180	3820	3580	4240	3880	3640
45	4540	4120	3820	4600	4180	3880	4720	4300	4000
50	4900	4480	4120	5020	4540	4240	5260	4660	4360

**Figure 6-11 (Sheet 2 of 2)**

## Safe Escape Table – MK82 High Drag Bomb

MINIMUM RISK RELEASE ALTITUDE												
DIVE ANGLE	400				450				500			
	RECOVERY 'g'				RECOVERY 'g'				RECOVERY 'g'			
	3	4	5	6	3	4	5	6	3	4	5	6
0	150	150	150	150	100	100	100	100	100	100	100	100
5	250	250	250	250	200	200	200	200	200	200	200	200
10	300	300	300	300	300	300	300	300	300	300	250	250
15	450	400	400	400	500	400	400	400	600	500	500	400
20	700	550	500	500	800	650	550	500	1000	750	650	600
25	950	750	650	550	1200	900	750	700	1400	1050	900	800
30	1300	1000	850	650	1600	1200	1000	900	1900	1450	1200	1050

DIVE ANGLE	550				600			
	RECOVERY 'g'				RECOVERY 'g'			
	3	4	5	6	3	4	5	6
0	100	100	100	100	100	100	100	100
5	150	150	150	150	150	150	150	150
10	400	300	300	250	400	350	300	300
15	700	550	500	450	850	650	550	500
20	1150	900	750	650	1350	1000	850	750
25	1650	1250	1050	900	1950	1450	1200	1050
30	2250	1700	1400	1200	2650	1950	1600	1400

**Figure 6-12**

## Exposure Time Table

**SOURCE** : F4C Flight Manual  
**ACCURACY** : Subject to minor errors (on safe side)  
in height loss information.  
**STATUS** : Interim

**DIVE ANGLE** – 45°  
**ROLL IN ALTITUDE** – 12000 ft  
**RELEASE ALTITUDE** – 7000 ft

4.0 'g' RECOVERY WITH A 30° CLIMB OUT ANGLE							
KTAS AT RELEASE	ALTITUDE* LOST DURING PULL-OUT	EXPOSURE TIME IN SECONDS•					
		BELOW 9500 ft	BELOW 8500 ft	BELOW 7500 ft	BELOW 6500 ft	BELOW 5500 ft	BELOW 4500 ft
450	2420	26.3	22.0	17.7	13.3	8.8	
500	2920	26.4	22.6	18.8	15.0	11.0	5.9
550	3450	27.0	23.5	20.1	16.6	13.0	8.9
5.0 'g' RECOVERY WITH A 30° CLIMB OUT ANGLE							
450	1910	24.5	19.6	14.9	10.3	5.2	
500	2310	23.4	19.4	15.7	11.4	7.2	
550	2730	23.4	19.8	16.2	12.6	8.9	3.8

**NOTE:**

No power advance was assumed until the nose of the aircraft passed through the horizon.  
Maximum power was applied as the nose of the aircraft passed through the horizon.

\* The values listed for altitude lost during pull-out are based on a starting altitude of 7000 ft.

• These time exposure assume that a 4.0 'g' recovery is attained 2.0 seconds after release. The 'g' is maintained until a 30° climb out is attained.

**Figure 6-13**

Dive Recovery Chart — 3 'g'

'g' ATTAINED IN 2 SECONDS  
NO SAFETY FACTORS  
NO REACTION TIME  
(COMPILED FROM WRE FIGURES —  
JUNE 1968)

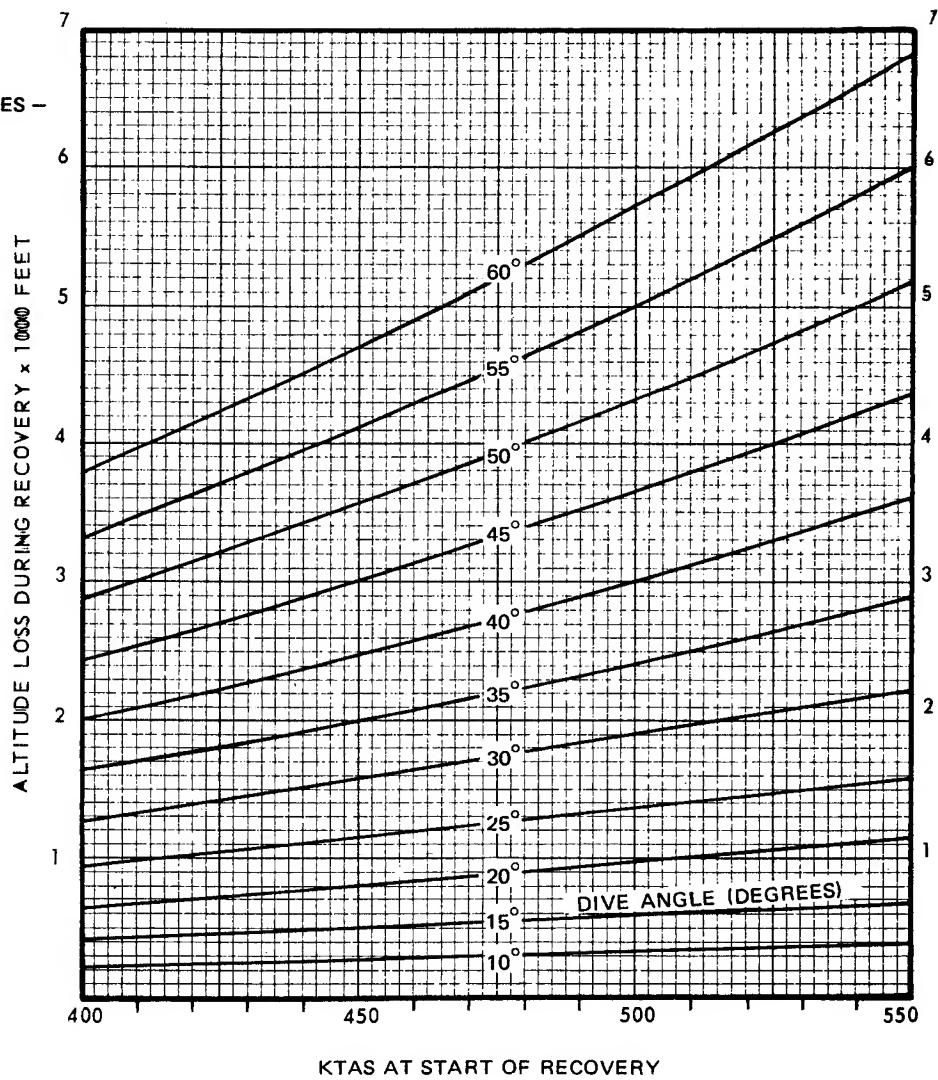


Figure 6-14



## Dive Recovery Chart — 4 'g'

'g' ATTAINED IN 2 SECONDS  
NO SAFETY FACTORS  
NO REACTION TIME  
(COMPILED FROM WRE FIGURES —  
JUNE 1968)

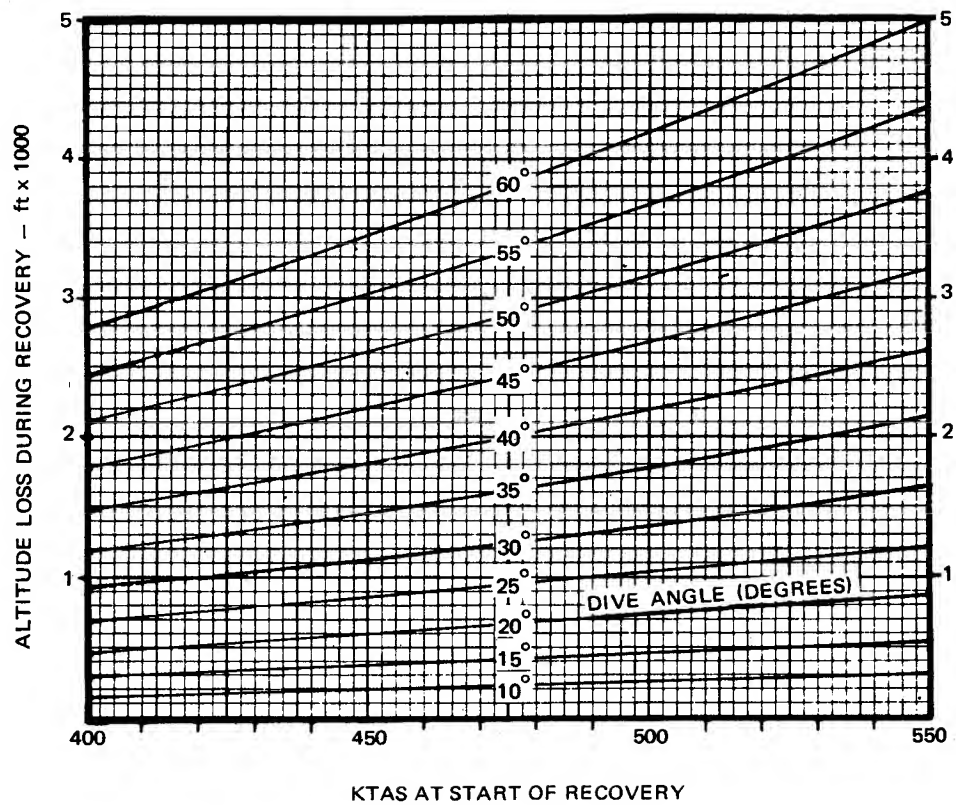


Figure 6-15

## Dive Recovery Chart — 5 'g'

'g' ATTAINED IN 2 SECONDS  
NO SAFETY FACTORS  
NO REACTION TIME  
(COMPILED FROM WRE FIGURES —  
JUNE 1968)

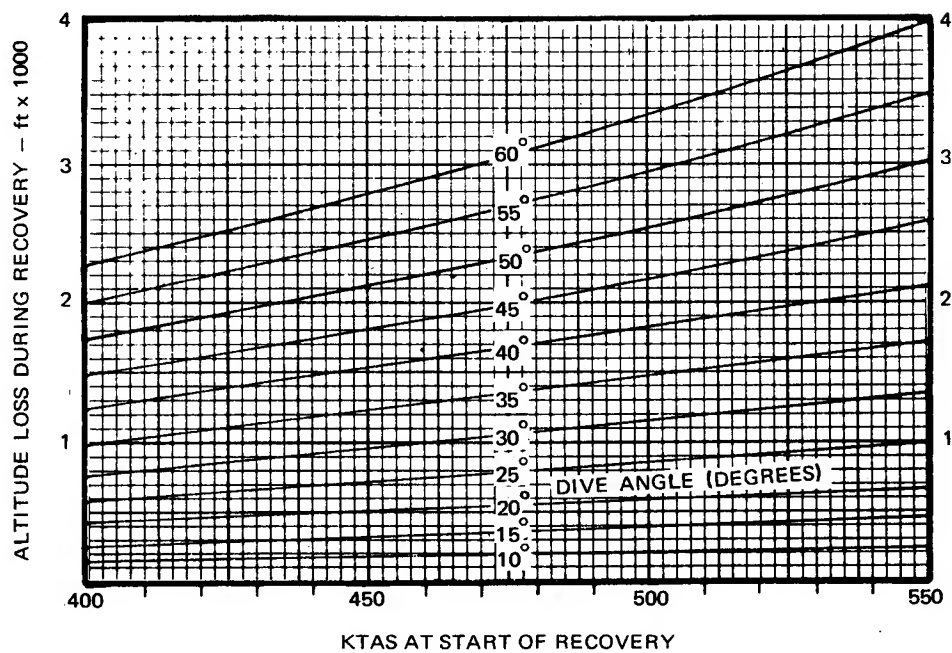


Figure 6-16

# Dive Recovery Chart — Banked Turn Pull-out — 4 'g'

SOURCE: F4C  
ACCURACY: 100 to 200 ft conservative  
STATUS: Interim

ALTITUDE LOSS DURING 4.0 'g' PULL-UP RECOVERY FOR A BANKED TURN PULL-OUT

## 15° DIVE

KNOTS TAS	WINGS LEVEL	10° BANK	20° BANK	30° BANK	45° BANK
450	390	390	410	420	470
500	460	460	480	500	570
550	540	540	560	580	670
600	620	620	640	670	780

## 30° DIVE

KNOTS TAS	WINGS LEVEL	10° BANK	20° BANK	30° BANK	45° BANK
450	1200	1210	1260	1340	1610
500	1440	1450	1510	1620	1970
550	1690	1710	1780	1920	2350
600	1960	1990	2070	2230	2740

## 45° DIVE

KNOTS TAS	WINGS LEVEL	10° BANK	20° BANK	30° BANK	45° BANK
450	2390	2430	2530	2740	3420
500	2900	2940	3080	3340	4200
550	3430	3480	3650	3970	5000
600	3960	4020	4210	4580	5750

Figure 6-17

# Vertical/Horizontal Component Chart

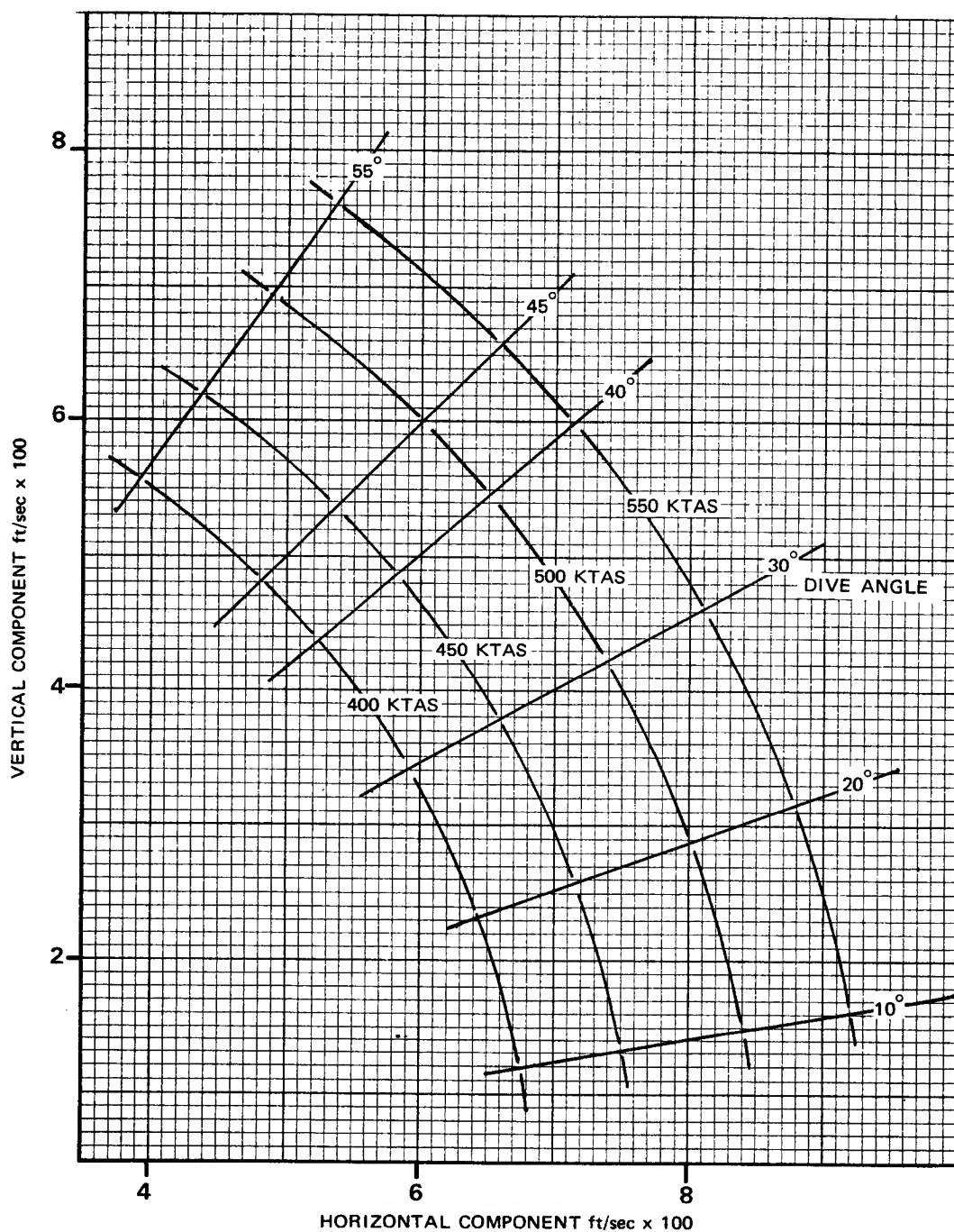


Figure 6-18

## Dive Angle Versus Distance

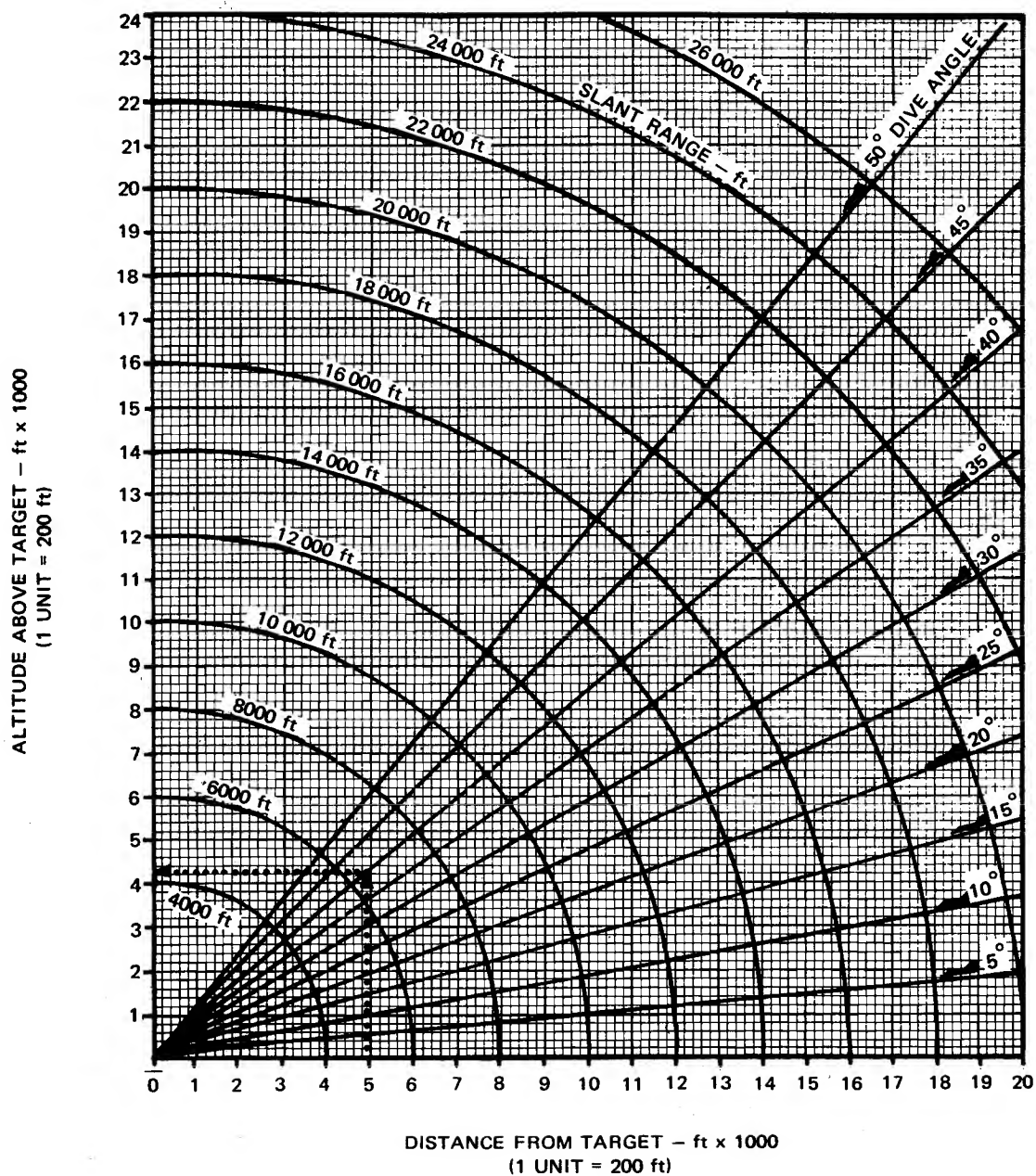
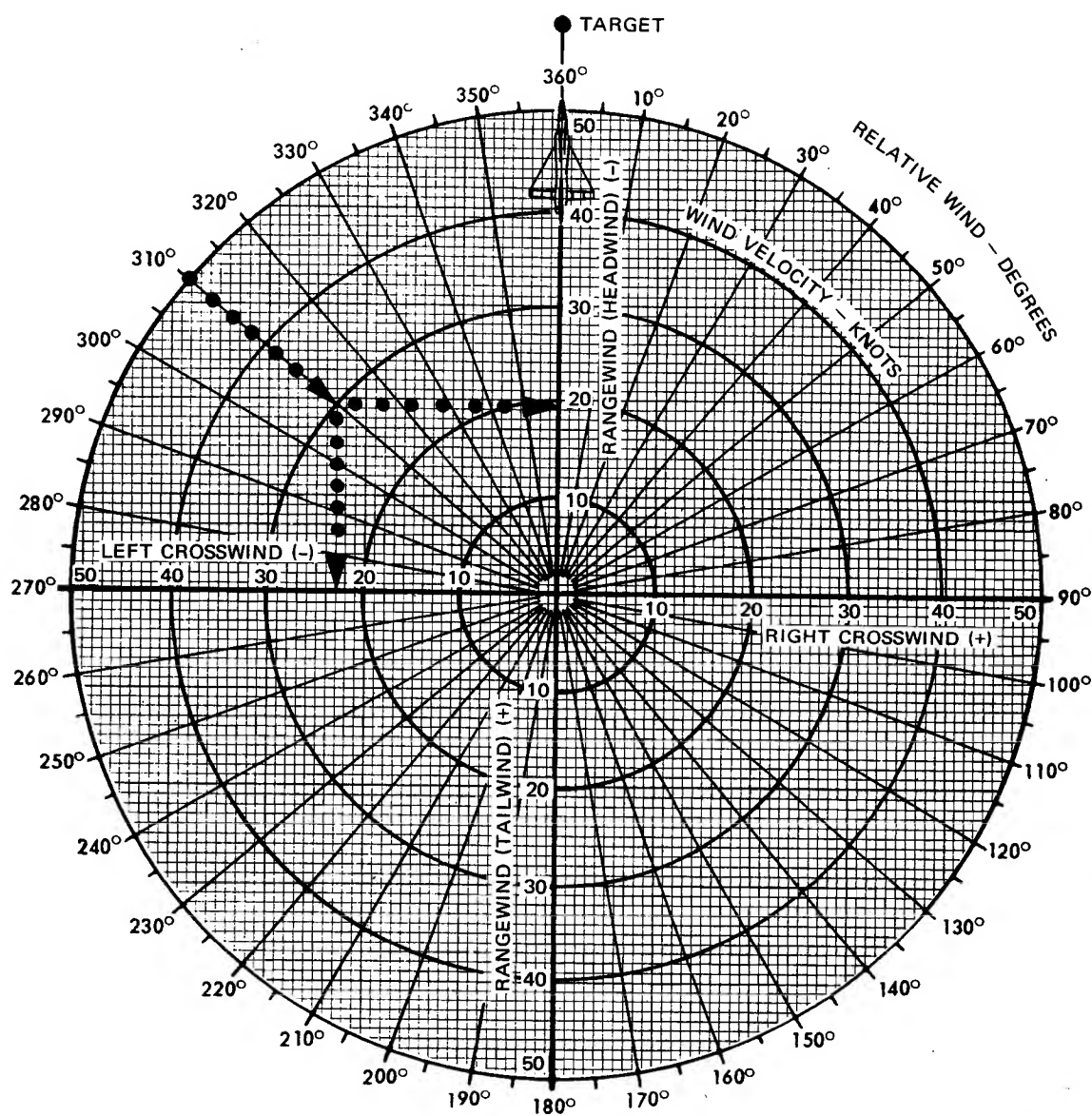


Figure 6-19

# Relative Wind Vector Chart



## EXAMPLE 1

GIVEN:  
 a. WIND DIRECTION 350°  
 b. APPROACH COURSE 040°  
 FIND: RELATIVE WIND 310°

## EXAMPLE 2

GIVEN:  
 a. WIND DIRECTION 040°  
 b. APPROACH COURSE 350°  
 (Since 350° is greater than 040°,  
 add 360° to the wind direction)  
 c. WIND DIRECTION 400°  
 d. APPROACH COURSE 350°  
 FIND: RELATIVE WIND 050°

Figure 6-20

RAAF SUPPLEMENT NO 34MIRAGE  
MATRA R550 DRAG INDICESInstruction

This supplement is to be inserted facing Page 6-25.

Action

Read the following information in addition to that found on Page 6-25:

***Table of Basic Weights, Store Weights and Drag Indices***

Store	Weight		Drag Index
	kg	lb	
2 x Matra R550 + pylons and launchers	330	728	70
2 x Type 40 launchers + adapters and pylons	152	335	20



**Table of Basic Weights, Store Weights and Drag Indexes**

Aircraft or Store	Weight		Fuel Weight		Fuel Qty gal	Drag Index
	kg	lb	kg	lb		
Mirage IIIO + pilot (see Notes 1, 2, 3 & 4)	6949	15 320	2150	4740	600	0
Mirage IIIO (WLE) + pilot (see Notes 1, 2, 3 & 4)	7017	15 470	2347	5175	655	0
Mirage IIID + 1 pilot (see Notes 1, 2, 3 & 4)	6949	15 320	2150	4740	600	0
Mirage IIID + 2 pilots (see Notes 1, 2, 3 & 4)	7049	15 540	2150	4740	600	0
Mirage IIID (WLE) + 2 pilots (see Notes 1, 2, 3 & 4)	7130	15 720	2347	5175	655	0
Gunbay Tank	45	100	258	569	72	0
Gunpack Empty	229	505				0
Gunpack + 250 Rounds	355	783				0
Dummy Gunpack	66	145				0
Matra + Pylon	230	508				53
Matra Pylon	39	85				15
2 Sidewinder + Pylons & Launchers	212	468				45
2 AERO-3B Launchers + 2 CES1 Pylons (S.W.)	61	134				15
2 × 110 gal Tanks (Unfinned)	145	320	788	1738	220	38
2 × 110 gal Tanks (Finned)	157	346	788	1738	220	75
1 × 286 gal (Fuselage) + Pylon	152	336	1025	2259	286	91
1 × 242 gal (Fuselage) + Pylon (see Note 6)	141	310	867	1912	242	91
Fuselage Tank Pylon	57	126				15
2 × 286 gal (Wing) + Pylons	296	652	2050	4519	572	144
2 × Wing Tank Pylons	78	172				28
2 × 374 gal Tanks + Pylons	348	768	2680	5909	748	166
1 × PM-3 Beam	80	177				20
2 × RPK10 Tank/Bomb Carriers (see Note 10)	440	970	788	1738	220	145
2 × RPK10 Tank/Bomb Carriers (see Note 11)	440	970	788	1738	220	180
2 × RPK10 Tank/Bomb Carriers (see Note 12)	440	970	788	1738	220	85
2 × RPK10 Tank/Bomb Carriers (see Note 13)	371	818	788	1738	220	90
SUU-20A/A + PM-3	230	507				120
SUU-20A/A + PM-3 + 6 BDU-33C/B (AUST) LDPB	298	657				130
SUU-20A/A + PM-3 + 6 BDU-33C/B (AUST) HDPB	298	657				150
2 MK82 Conical Fin on PM-3 (see Notes 7 & 8)	561	1237				64
2 MK82 Conical Fin on 2 RPK10 (see Notes 7 & 8)	921	2030	788	1738	220	130
4 MK82 Conical Fin on 2 RPK10 (see Notes 7, 8 & 9)	1397	3090	788	1738	220	140
6 MK82 Conical Fin on 2 RPK10 (not cleared) (see Notes 7 & 8)	1883	4150	788	1738	220	237
8 MK82 Conical Fin on 2 RPK10 (not cleared) (see Notes 7 & 8)	2363	5210	788	1738	220	252
2 MK82 Snakeye on 2 RPK10	948	2090	788	1738	220	180
4 MK82 Snakeye on 2 RPK10	1456	3210	788	1738	220	210
AN/ALQ-72 ECM Pod + PM-3 Beam	171	377				32
AN/ALE-32 Chaff Dispenser (full) + 1 × 110 gal Tank	236	521	394	869	110	38
Pannier (empty) + Pylon (see Note 6)	152	336				91
Pannier (maximum loaded) + Pylon (see Note 6)	606	1336				91

**Figure 6-21 (Sheet 1 of 2)**



## **Table of Basic Weights, Store Weights and Drag Indexes**

- NOTE
1. Aircraft basic weights are fleet averages derived from DI(AF) AAP 7213.003-5 Mirage IIIO and IIID Loading and Balance Summary as at May 1981. Individual aircraft weights can vary considerably and if AUW is critical DI(AF) AAP 7213.003-5 or the aircraft log book should be consulted.
  2. The basic weight includes oil, oxy and brake chute with the GB position unoccupied.
  3. Appropriate gunbay store weight must be added.
  4. Pilot allowance is 220 lb.
  5. Fuel weights are based on a fuel density of 7.9 lb/gal Imp advised by Australian Institute of Petroleum, July 1977.
  6. Weight and drag index estimated for 242 gal tank and pannier.
  7. MK82 bomb figures are based on MK82 bombs with conical fin including nose and tail fuses, ie 530 lb. For MK82 bombs with Snakeye add 30 lb per bomb.
  8. Drag indexes for bombs with Snakeye could be slightly higher than those quoted for bombs with conical fins.
  9. These figures are subject to validation and should be used with caution.
  10. Only outboard ejector pistons extended.
  11. All ejector pistons extended.
  12. All ejector pistons retracted.
  13. Without release units.

**Figure 6-21(Sheet 2 of 2)**

# Balance Chart — Mirage IIIO With Bombs on PM-3

## LOADING CONFIGURATION

- A. Inverted accumulator fuel
- B. Pilot and equipment
- C. Rocket bay tank
- D. Gun bay tank
- E. Wing tanks
- F. PM-3 + two MK82 (HE) bombs
- G. Fuselage internal fuel
- H. Rocket bay fuel
- I. Wing internal fuel
- J. Gun bay fuel
- K. Wing external fuel

## CONFIGURATION KEY AND LOADING LIMITATIONS

Two 110 gal wing tanks	—————
Two 286 gal wing tanks	-----
Two 374 gal wing tanks	-----
Forward limit to all aircraft	47.5% SMC
Aft CG limit with external loads (except two 110 gal tanks)	53.2% SMC
Aft CG limit (two 110 gal tanks)	54.0% SMC
Aft CG limit clean aircraft	54.6% SMC

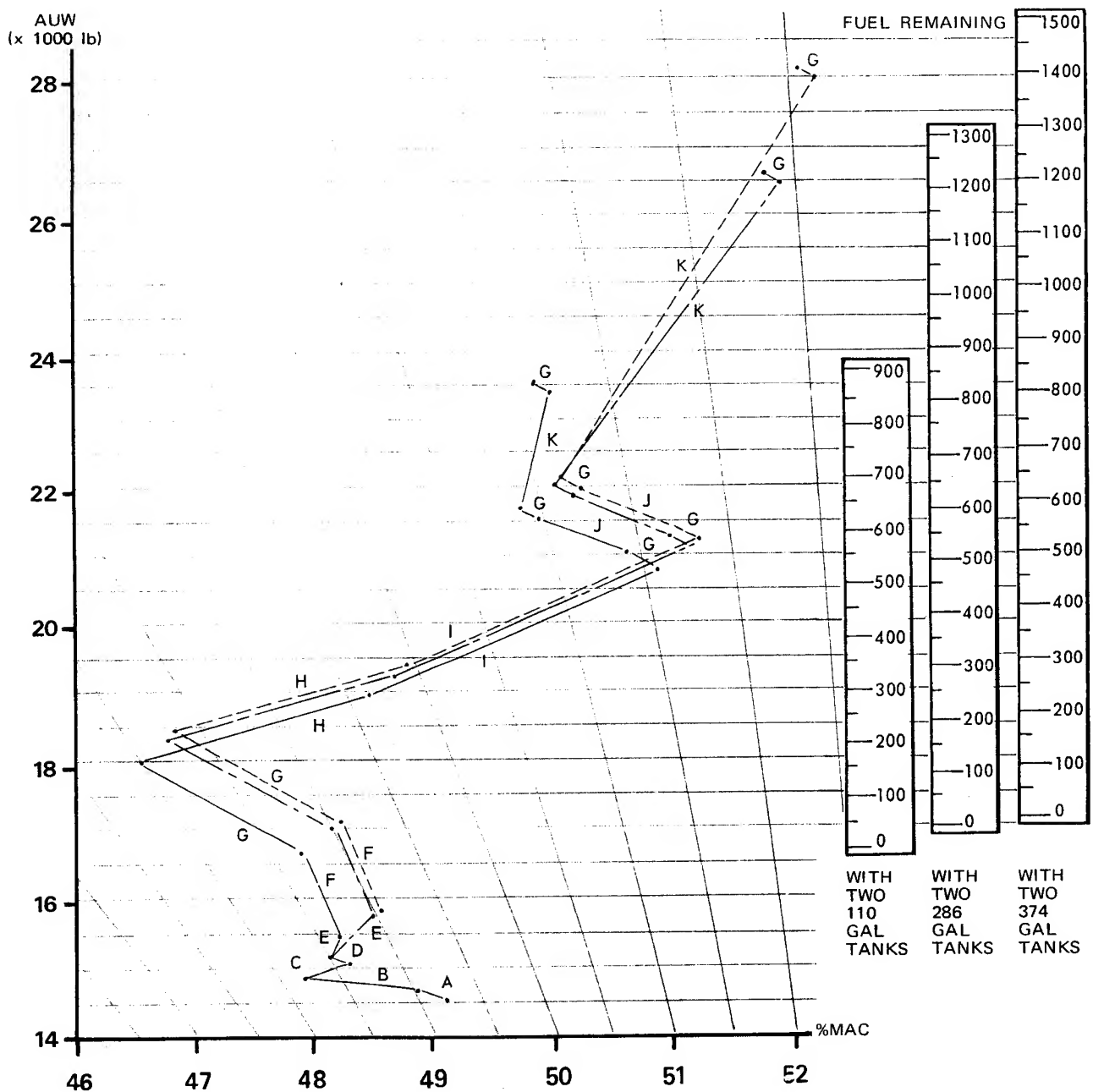


Figure 6-22

# Balance Chart — Mirage IIIO Without Bombs

## LOADING CONFIGURATION

- A. Inverted accumulator fuel
- B. Pilot and equipment
- C. Rocket bay tank
- D. Gun bay tank
- E. Wing tanks
- F. PM-3
- G. Fuselage internal fuel
- H. Rocket bay fuel
- I. Wing internal fuel
- J. Gun bay fuel
- K. Wing external fuel

## CONFIGURATION KEY AND LOADING LIMITATIONS

Two 110 gal wing tanks	—————
Two 286 gal wing tanks	-----
Two 374 gal wing tanks	-----
Forward limit to all aircraft	47.5% SMC
Aft CG limit with external loads (except two 110 gal tanks)	53.2% SMC
Aft CG limit (two 110 gal tanks)	54.0% SMC
Aft CG limit clean aircraft	54.6% SMC

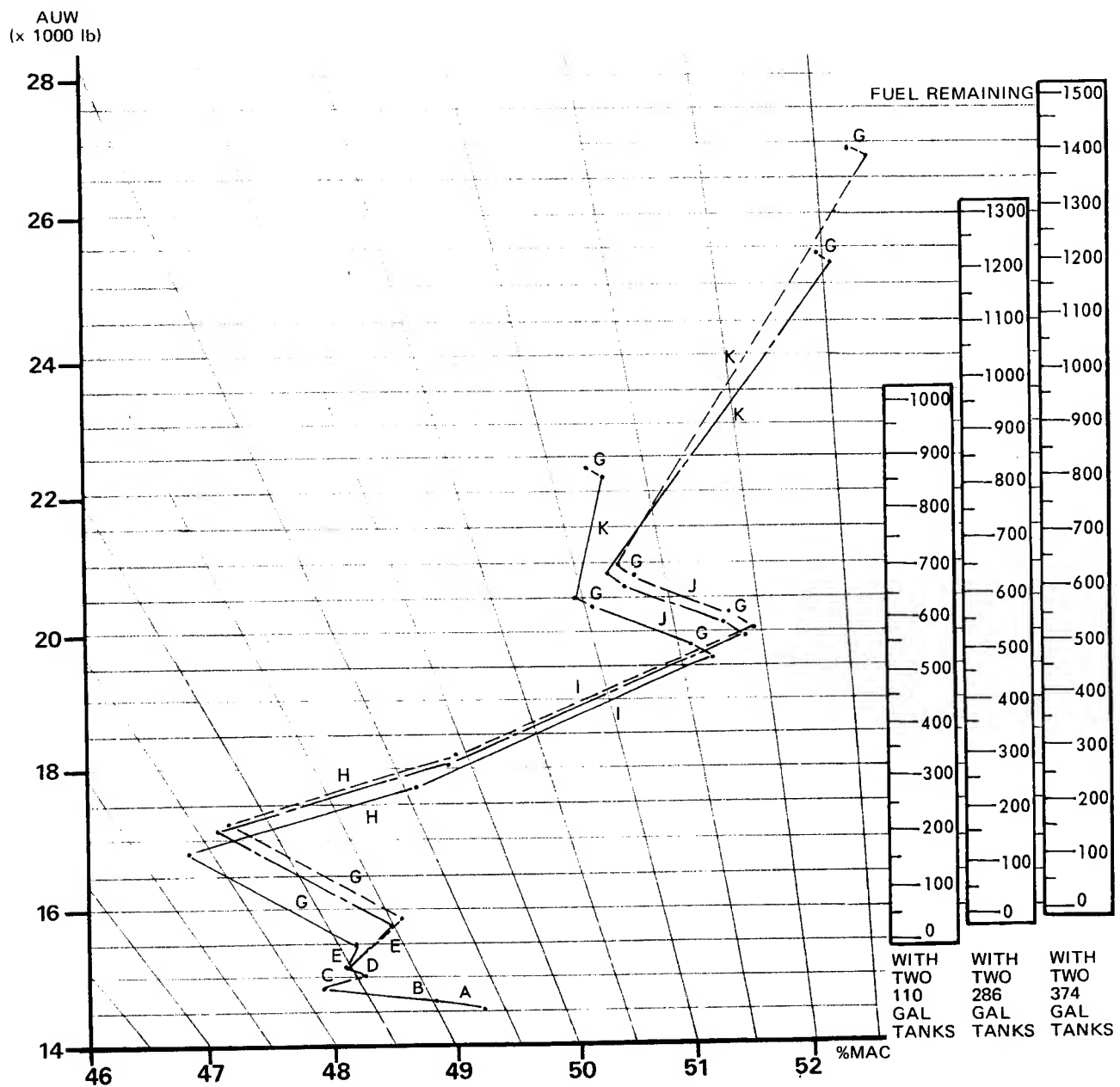


Figure 6-23

# Balance Chart — Mirage IIIO (WLE) With Bombs on PM-3

## LOADING CONFIGURATION

- A. Inverted accumulator fuel
- B. Pilot and equipment
- C. Rocket bay tank
- D. Gun bay tank
- E. Wing tanks
- F. PM-3 + two MK82 (HE) bombs
- G. Fuselage internal fuel
- H. Rocket bay fuel
- I. Wing internal fuel
- J. Gun bay fuel
- K. Wing external fuel

## CONFIGURATION KEY AND LOADING LIMITATIONS

Two 110 gal wing tanks	—————
Two 286 gal wing tanks	-----
Two 374 gal wing tanks	-----
Forward limit to all aircraft	47.5% SMC
Aft CG limit with external loads (except two 110 gal tanks)	53.2% SMC
Aft CG limit (two 110 gal tanks)	54.0% SMC
Aft CG limit clean aircraft	54.6% SMC

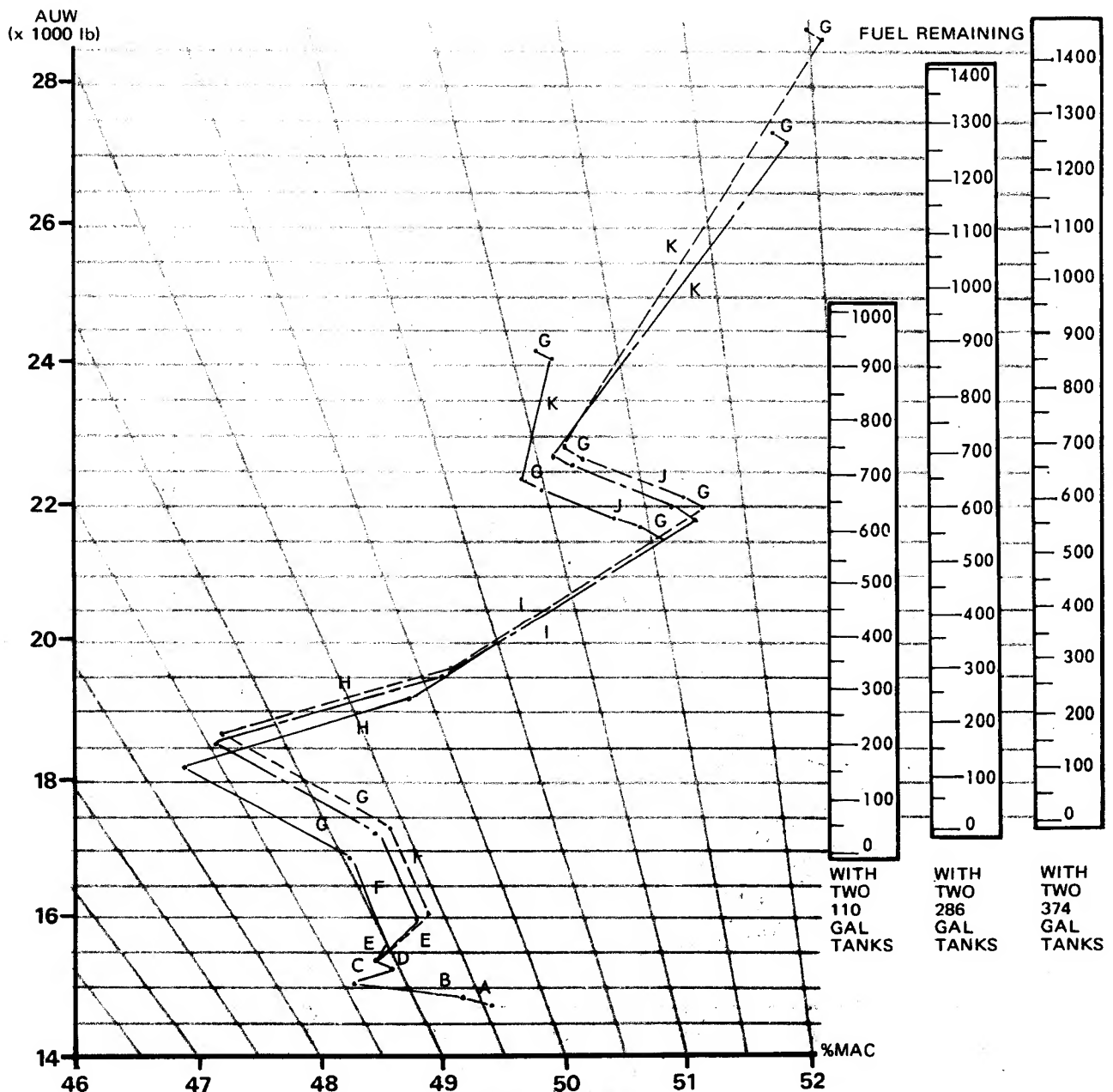


Figure 6-24

# **Balance Chart — Mirage IIIO (WLE) Without Bombs**

## **LOADING CONFIGURATION**

- A. Inverted accumulator fuel
- B. Pilot and equipment
- C. Rocket bay tank
- D. Gun bay tank
- E. Wing tanks
- F. PM-3
- G. Fuselage internal fuel
- H. Rocket bay fuel
- I. Wing internal fuel
- J. Gun bay fuel
- K. Wing external fuel

## **CONFIGURATION KEY AND LOADING LIMITATIONS**

Two 110 gal wing tanks	—————
Two 286 gal wing tanks	-----
Two 374 gal wing tanks	- - - - -
Forward limit to all aircraft	47.5% SMC
Aft CG limit with external loads (except two 110 gal tanks)	53.2% SMC
Aft CG limit (two 110 gal tanks)	54.0% SMC
Aft CG limit clean aircraft	54.6% SMC

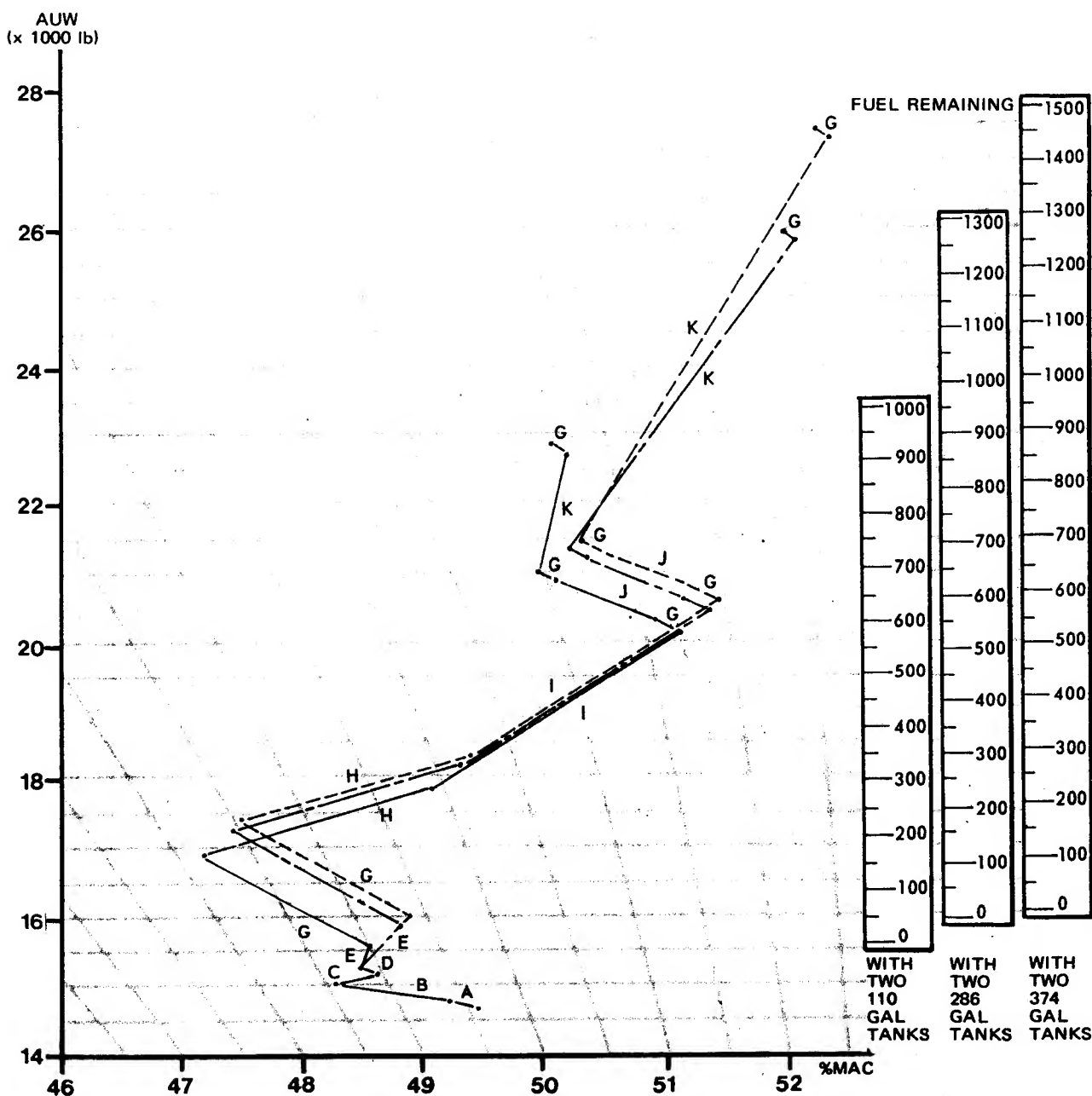


Figure 6-25

## ***Balance Chart — Mirage IIIO With Bombs on RPK10***

**TO BE ISSUED**

***Figure 6-26***

## ***Balance Chart — Mirage IIIO (WLE) With Bombs on RPK10***

**TO BE ISSUED**

***Figure 6-27***

# Incidence Chart — Clean or With Two 110 gal Tanks

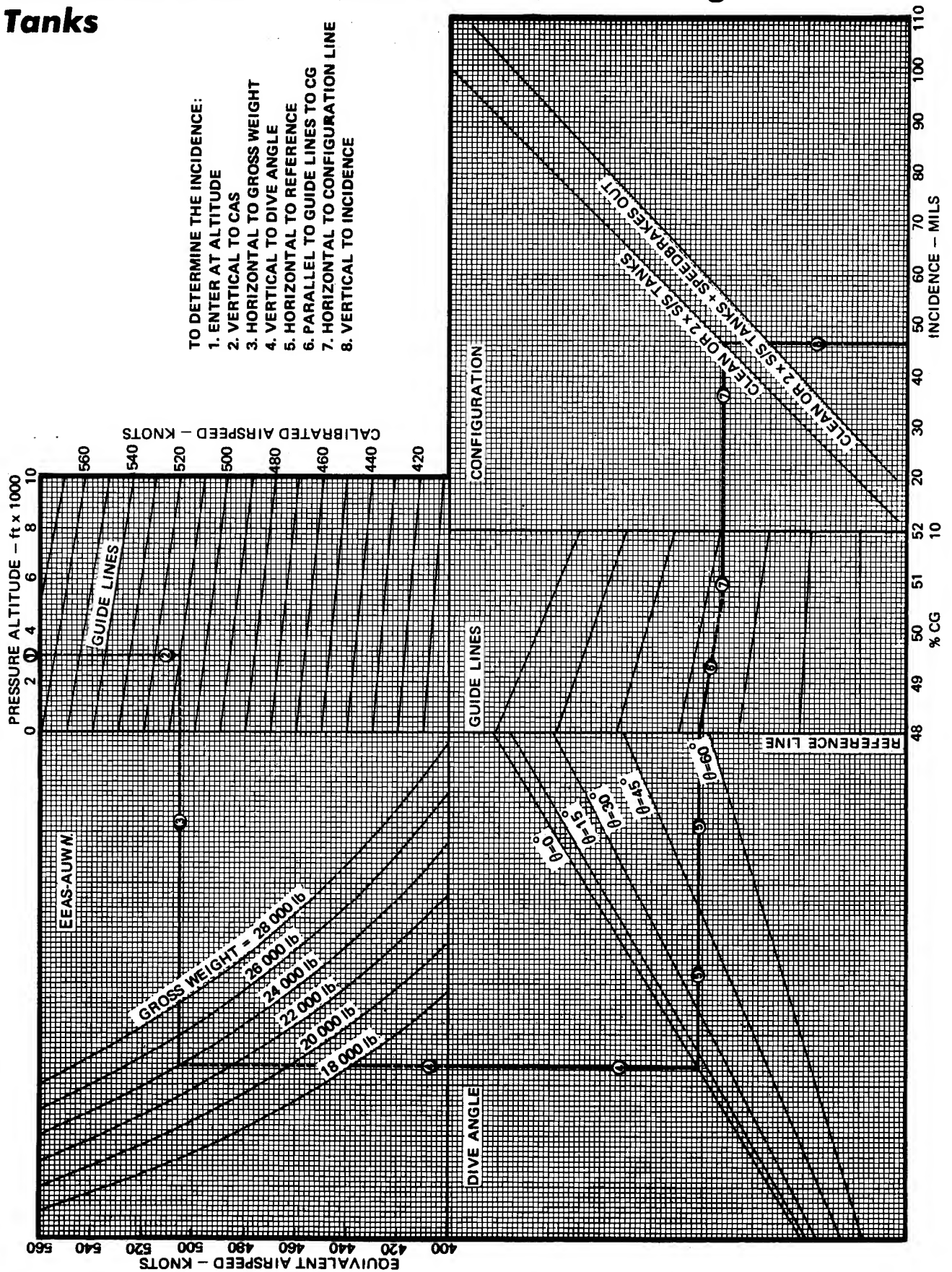


Figure 6-28



Incidence Chart — Two 286 gal Tanks

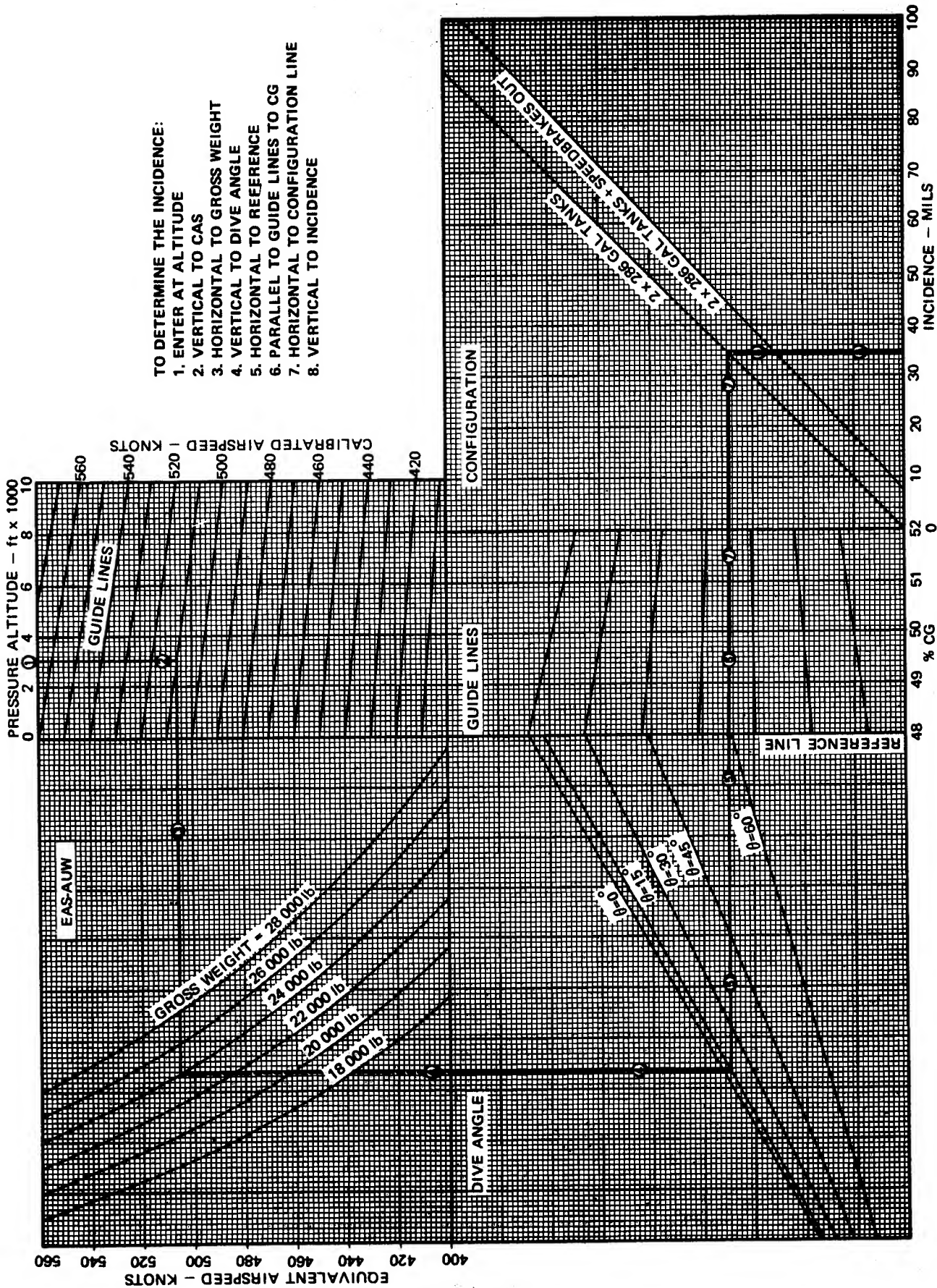


Figure 6-29

## Aim-off Angle — Level Flight — 0 to 7000 ft

SOURCE: F4C WEAPONS DELIVERY MANUAL

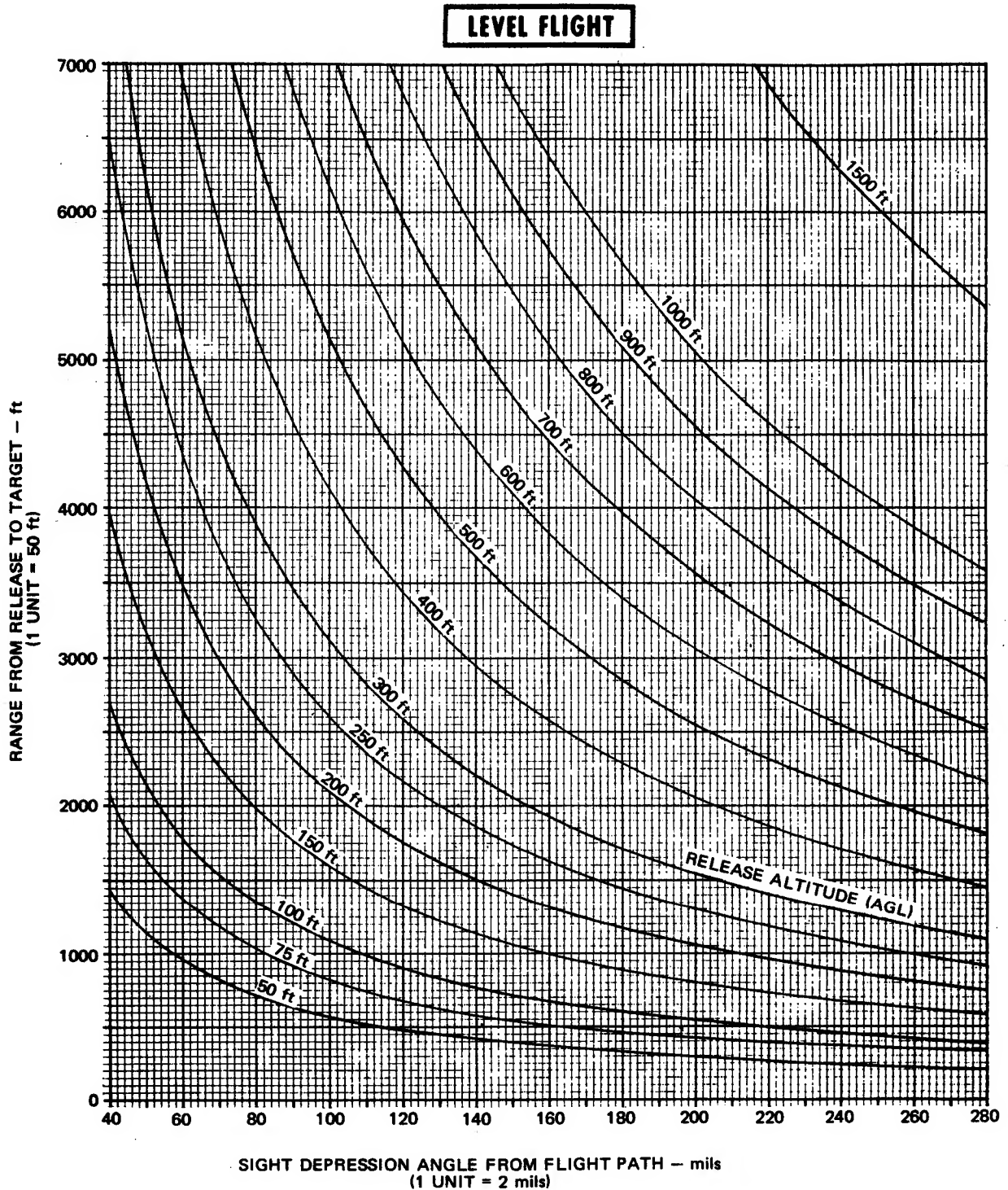


Figure 6-30

# Aim-off Angle — Level Flight — 6000 to 14 000 ft

SOURCE: F4C WEAPONS DELIVERY MANUAL

## LEVEL FLIGHT

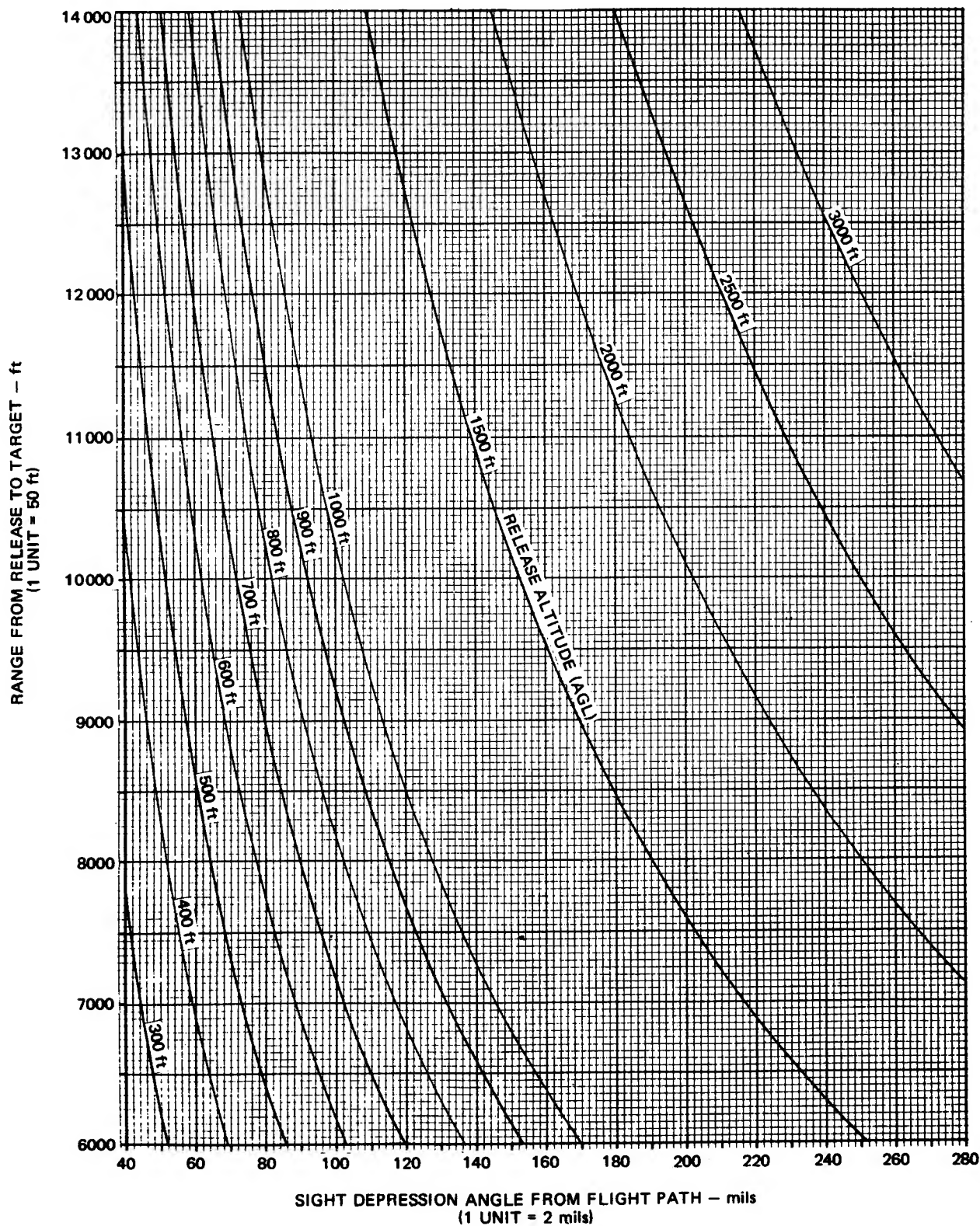


Figure 6-31

## Aim-off Angle – 5° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

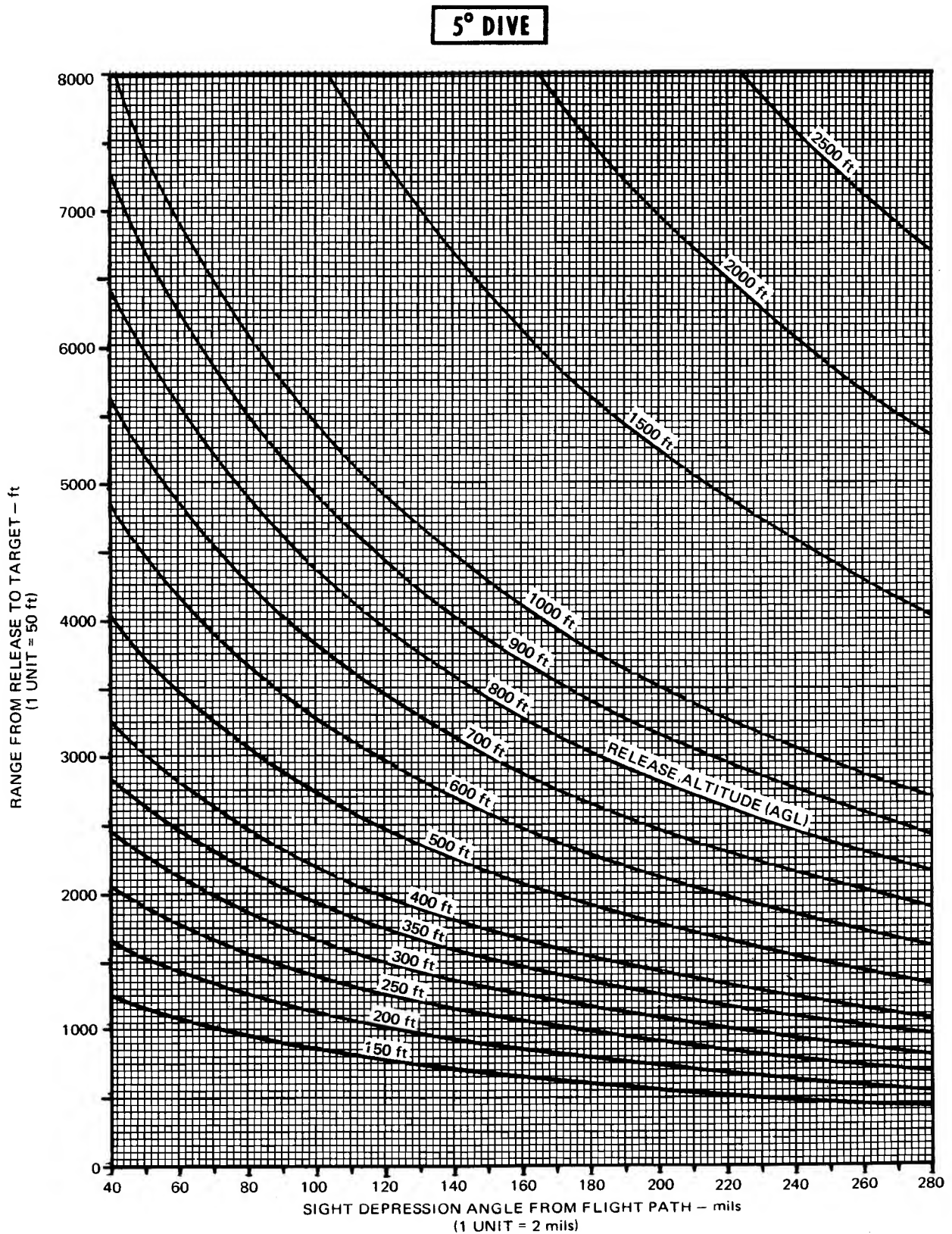


Figure 6-32



# Aim-off Angle — 10° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

**10° DIVE**

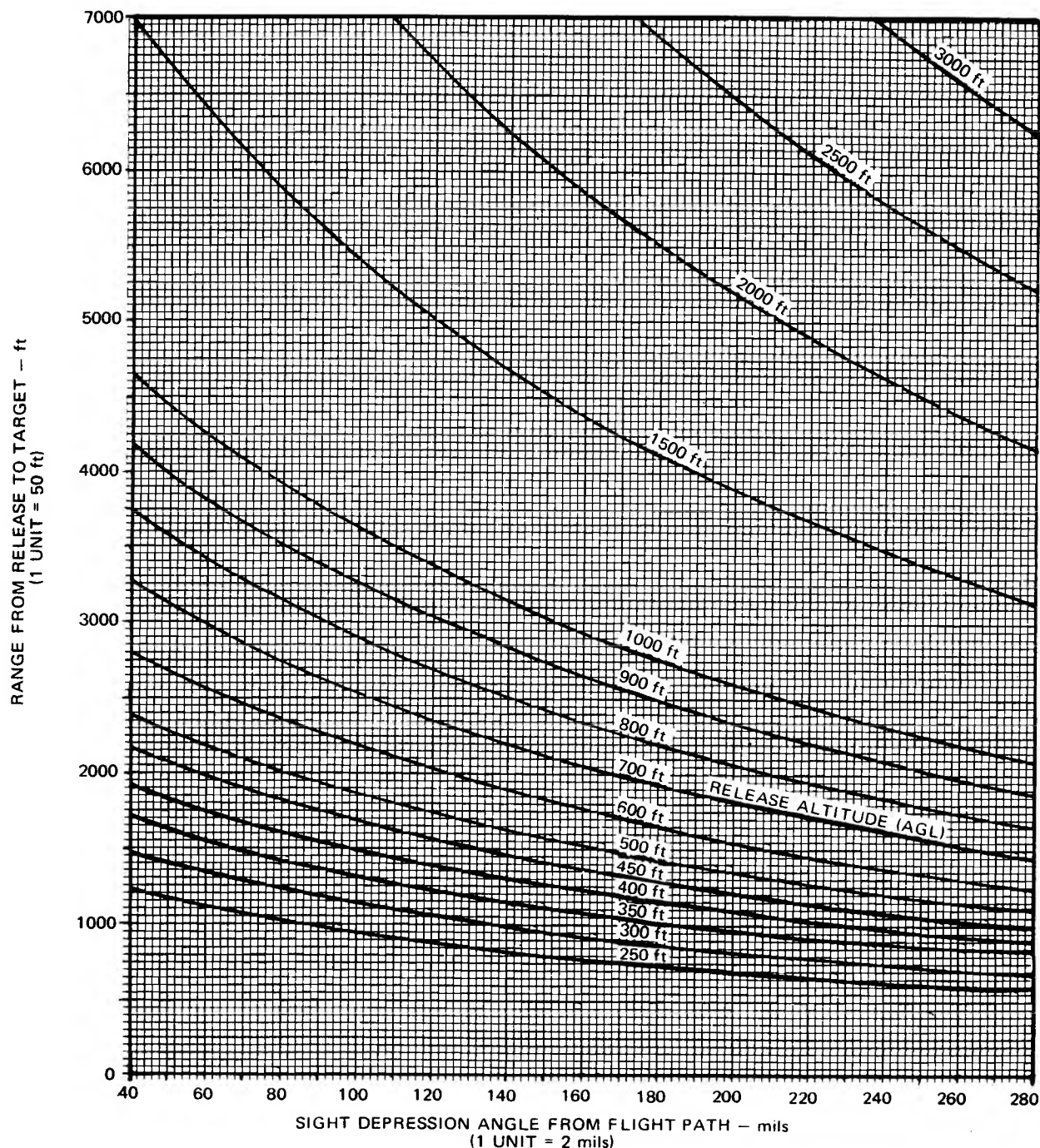


Figure 6-33

# Aim-off Angle – 15° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

15° DIVE

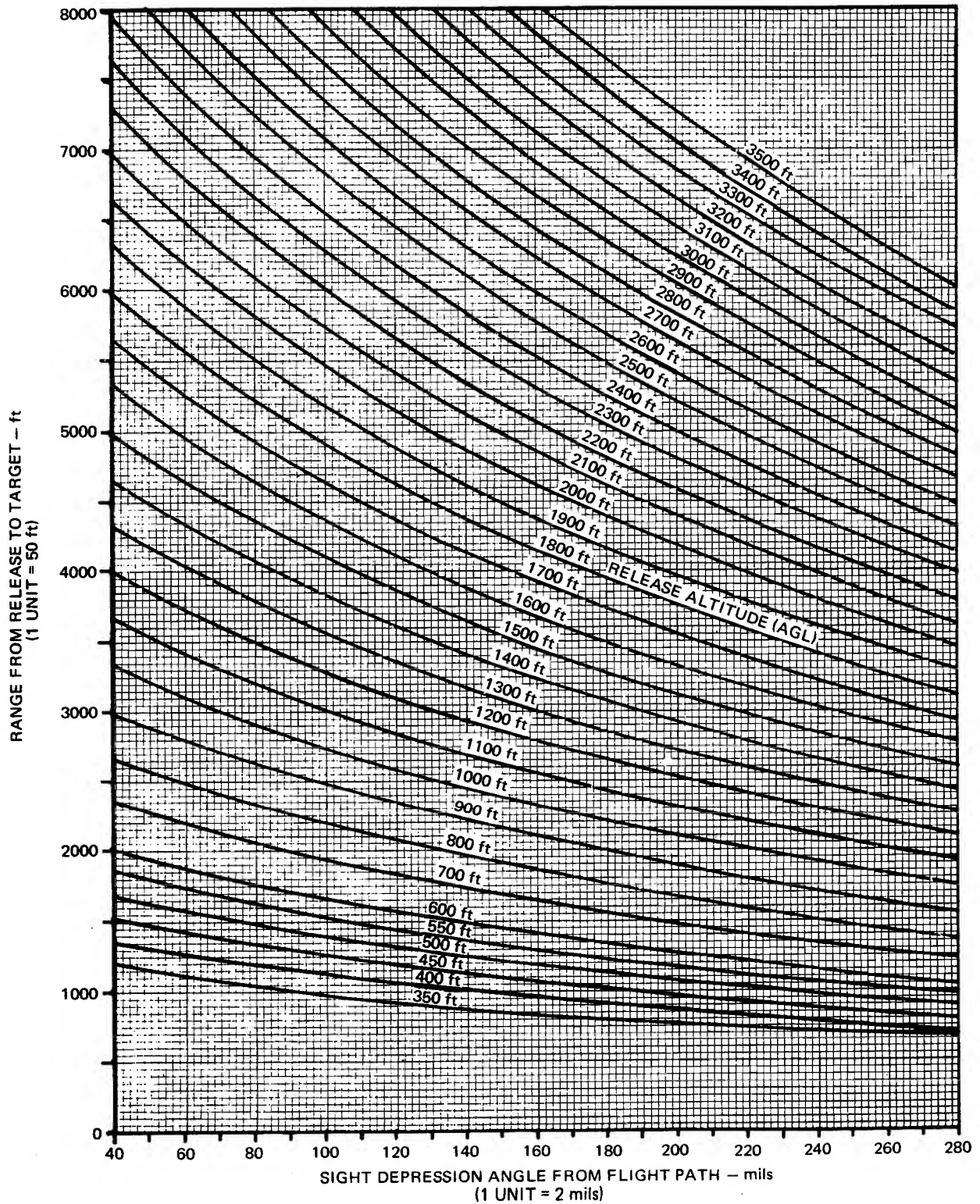


Figure 6-34

# Aim-off Angle – 20° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

20° DIVE

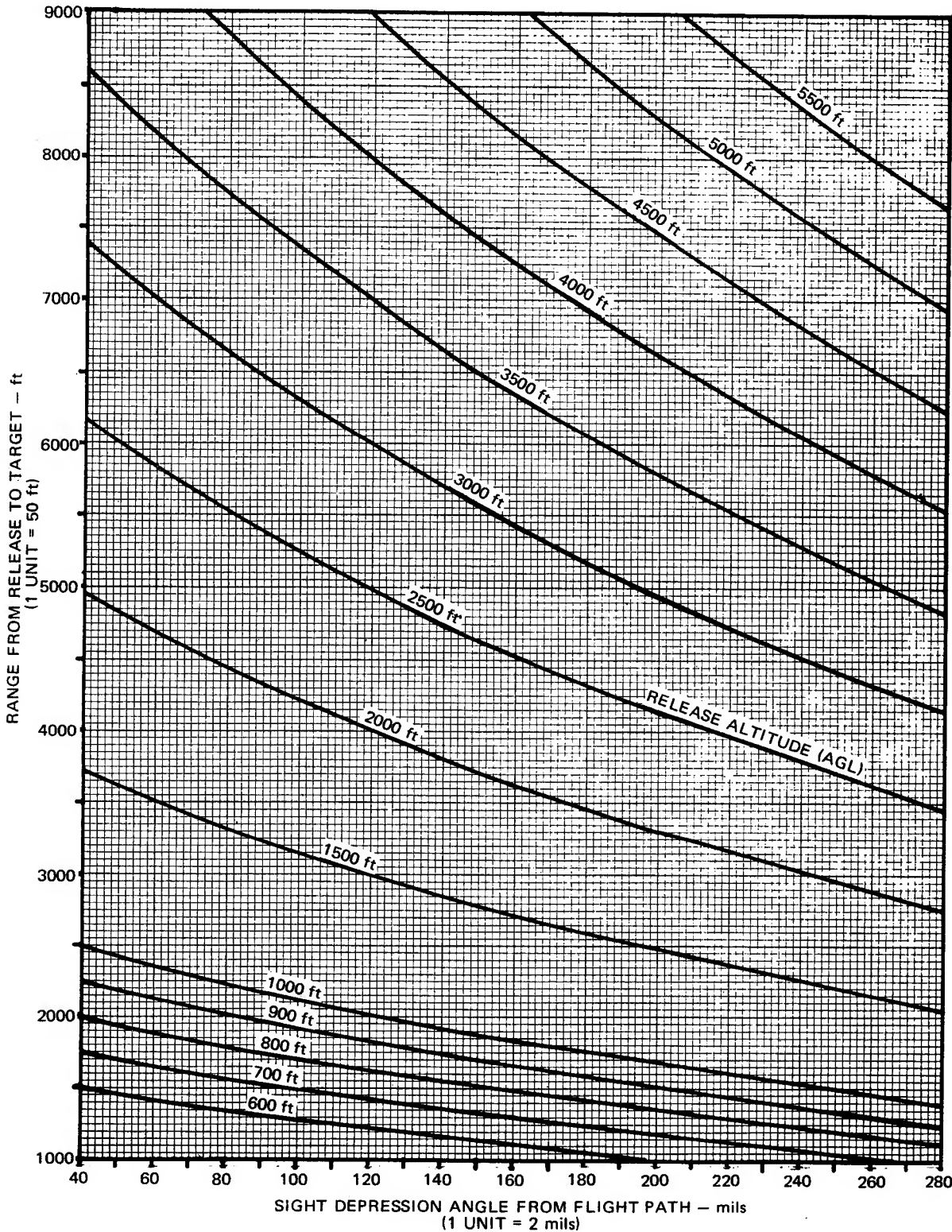


Figure 6-35

# Aim-off Angle — 25° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

**25° DIVE**

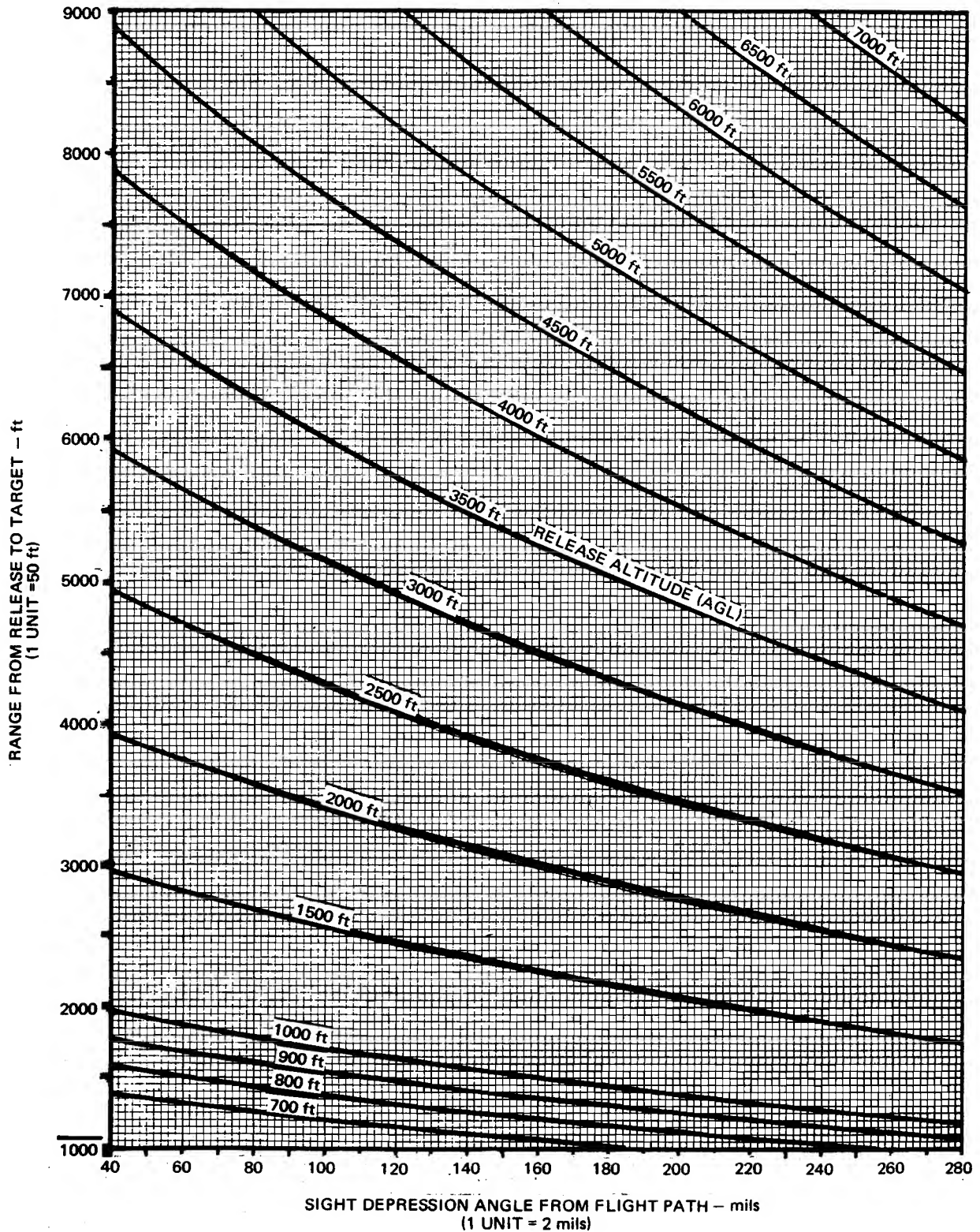


Figure 6-36



# Aim-off Angle – 30° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

30° DIVE

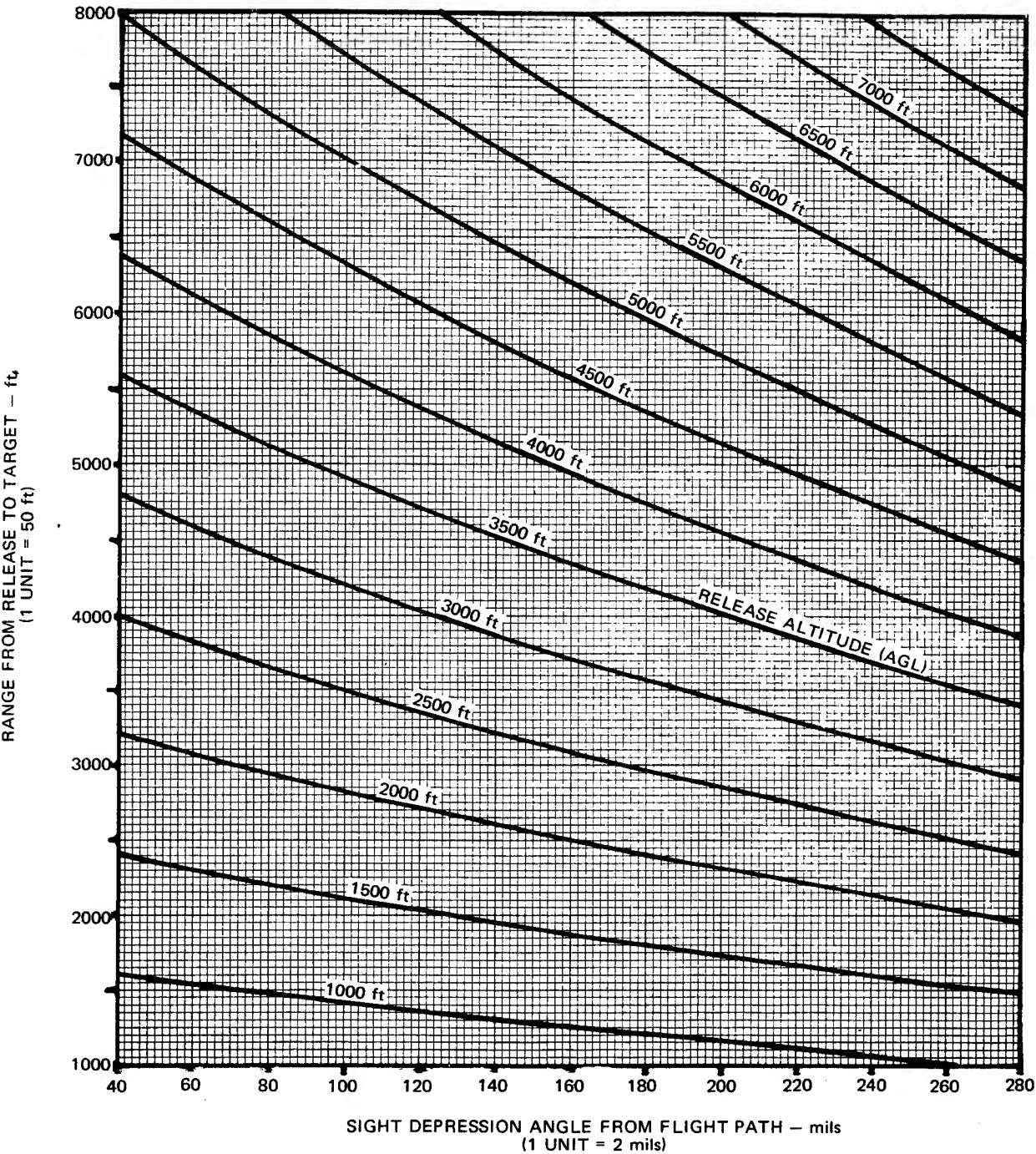


Figure 6-37

# Aim-off Angle — 35° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

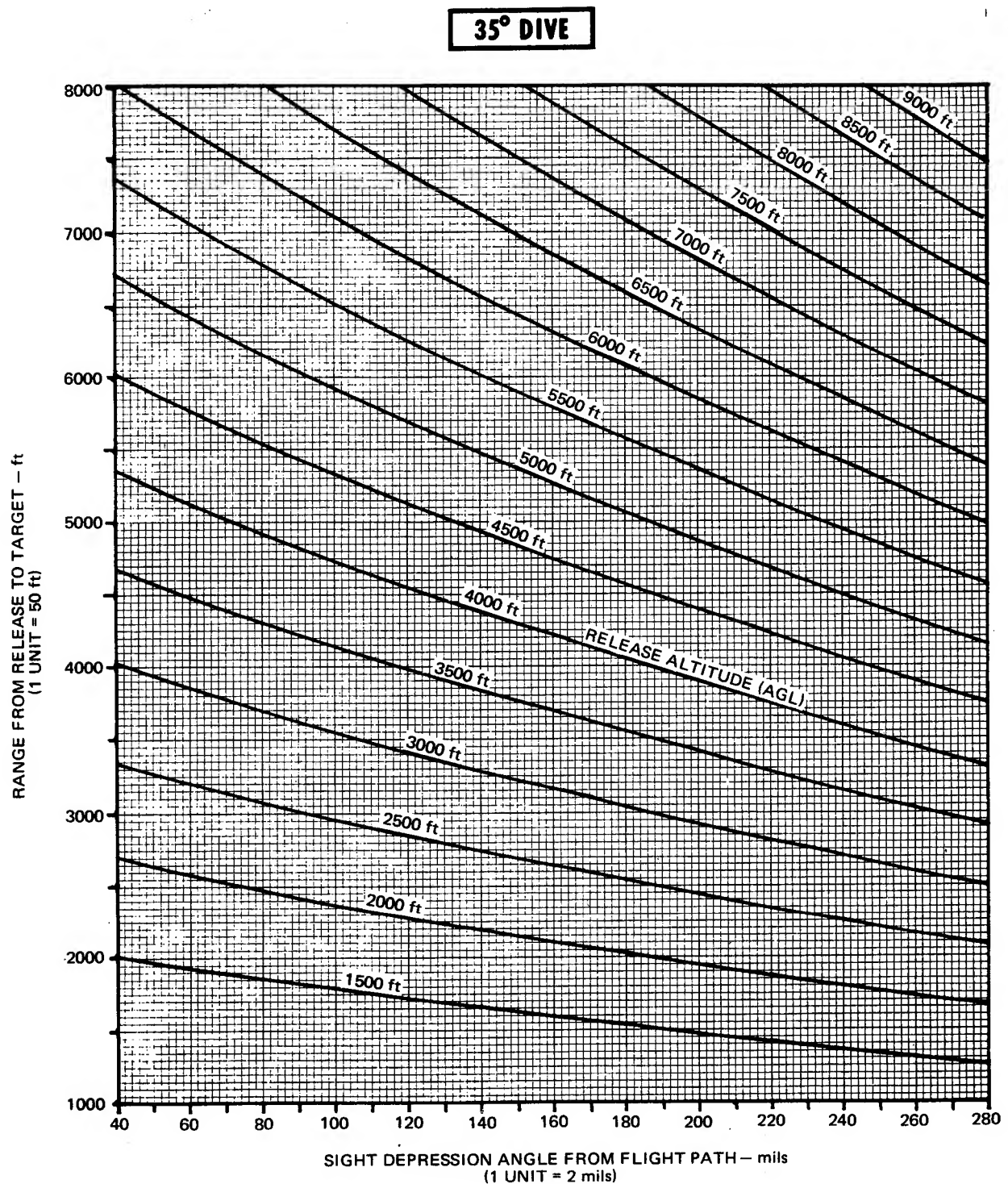


Figure 6-38

# Aim-off Angle — 40° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

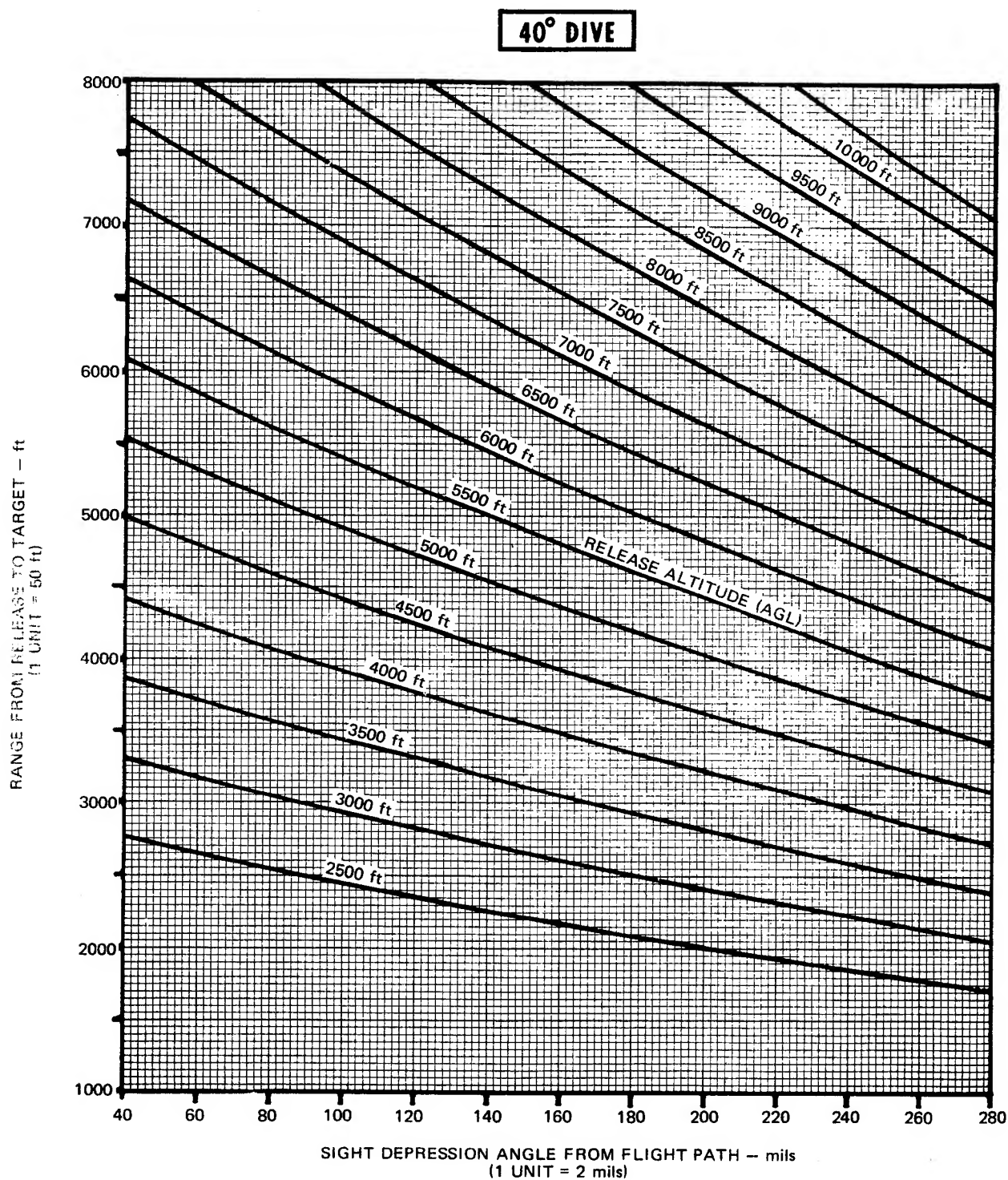


Figure 6-39

## Aim-off Angle — 45° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

**45° DIVE**

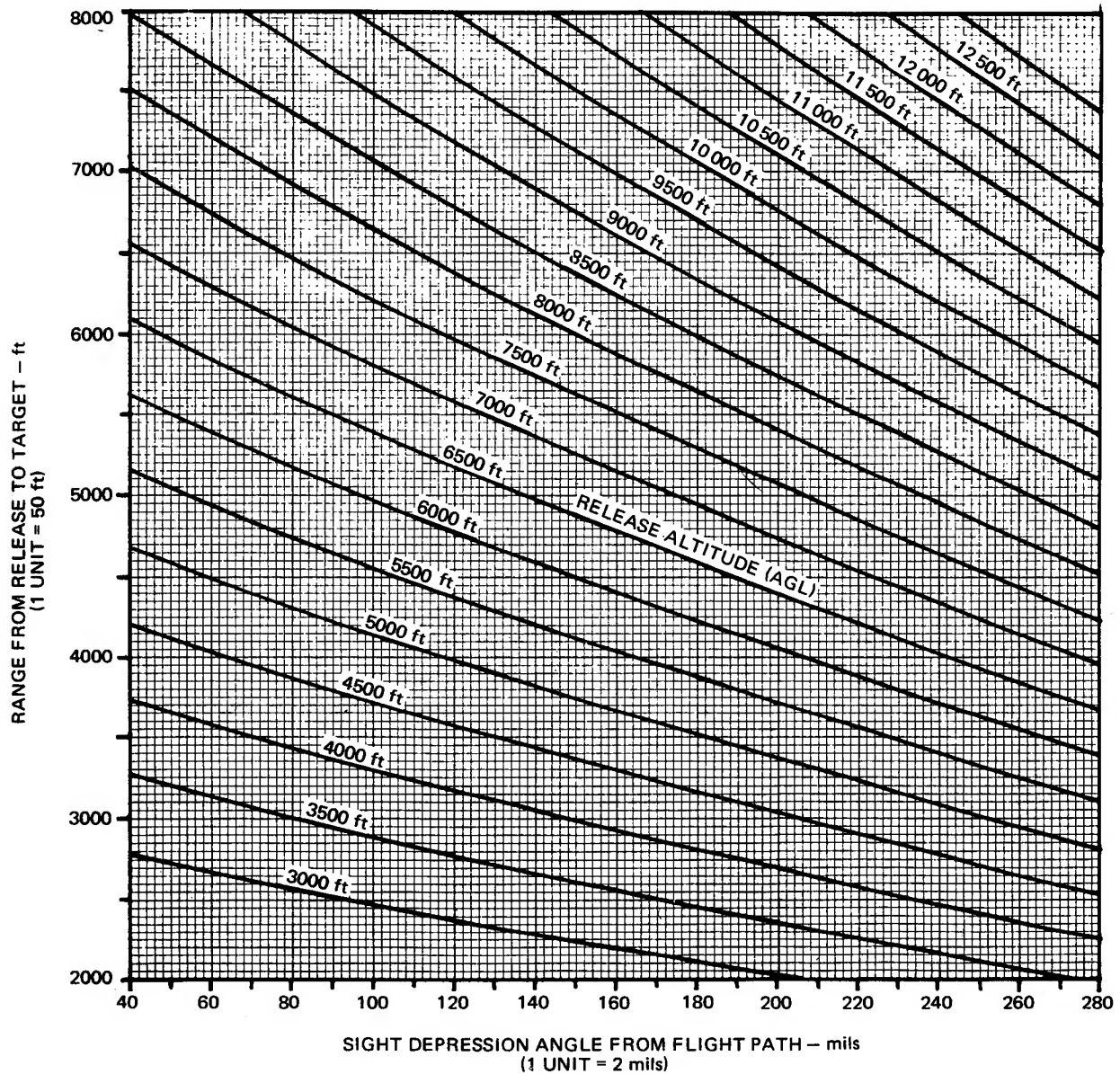


Figure 6-40

# Aim-off Angle — 50° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

50° DIVE

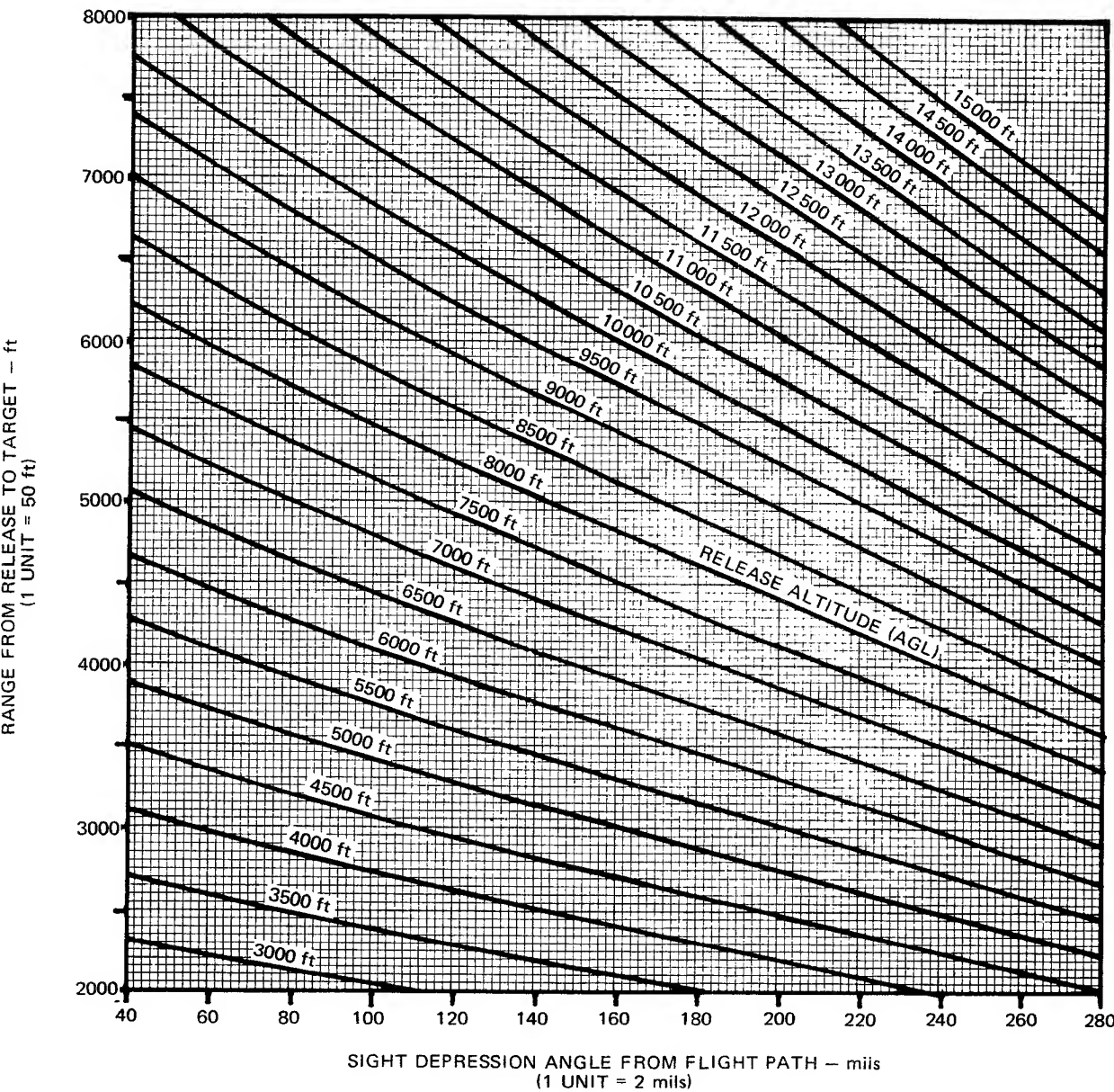


Figure 6-41



# Aim-off Angle – 55° dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

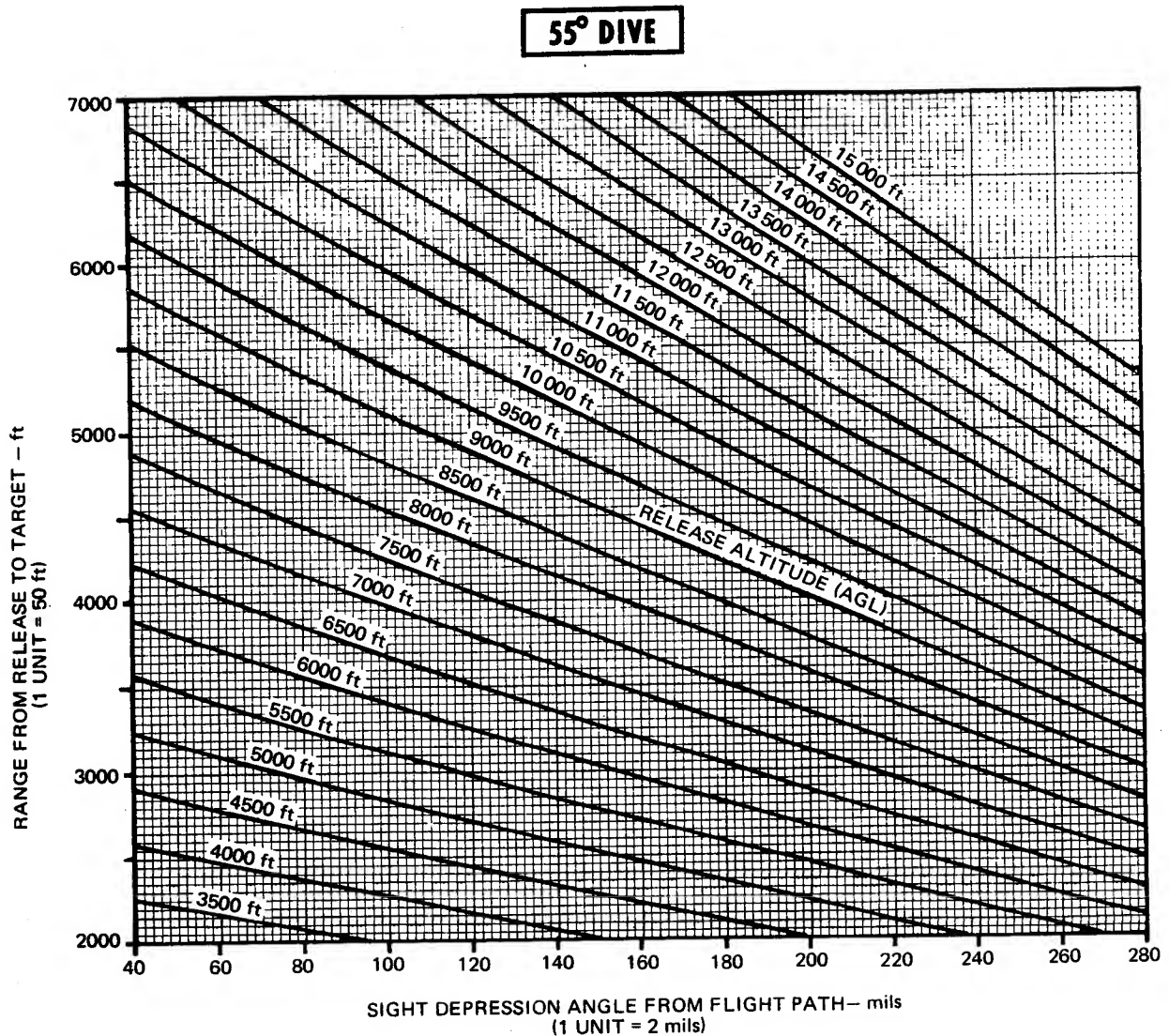


Figure 6-42

# Aim-off Angle — 60° Dive

SOURCE: F4C WEAPONS DELIVERY MANUAL

**60° DIVE**

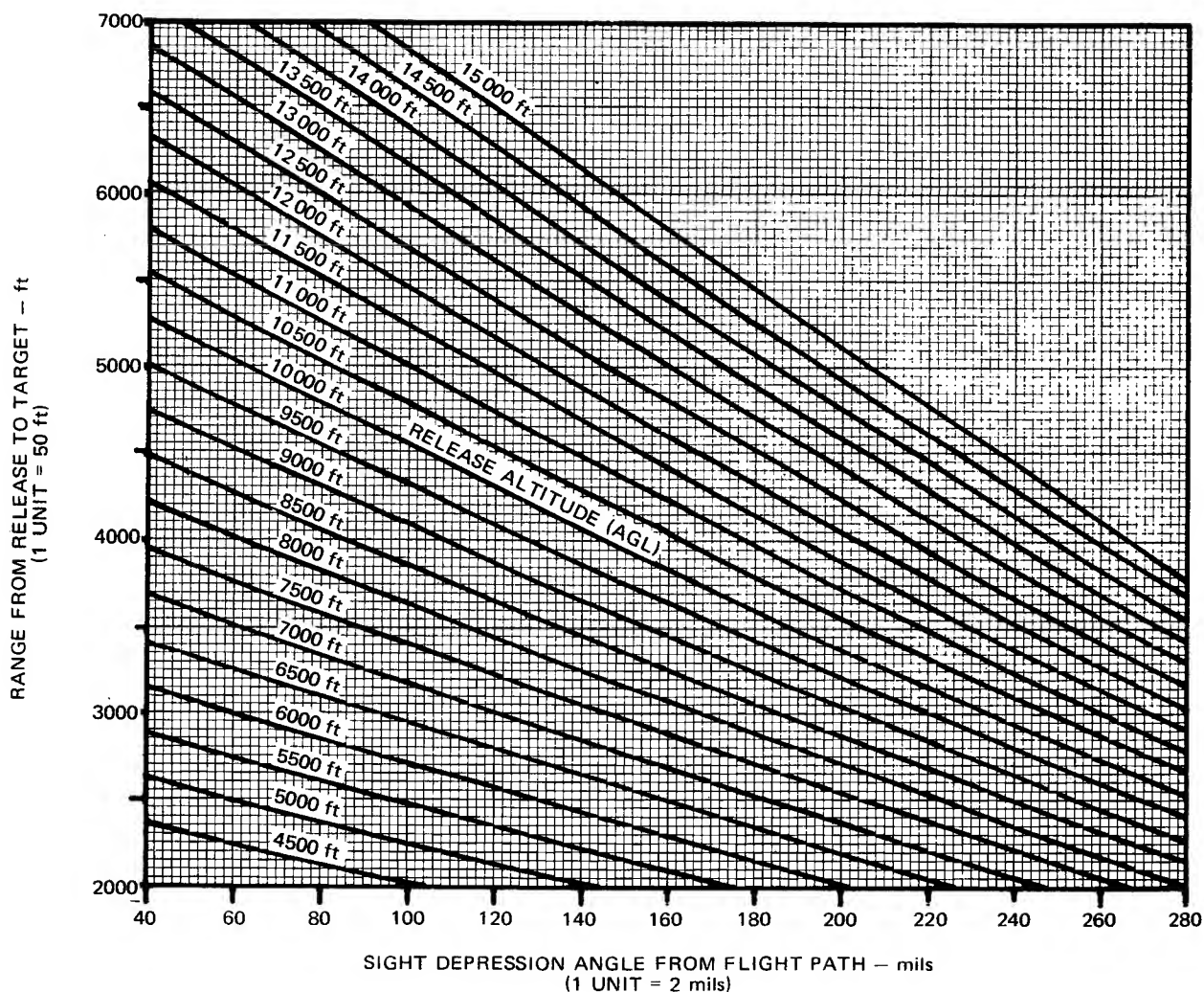


Figure 6-43

## Aim-off Distance Chart — 10° Dive Angle

SOURCE: USAF FIGHTER WEAPONS NEWSLETTER

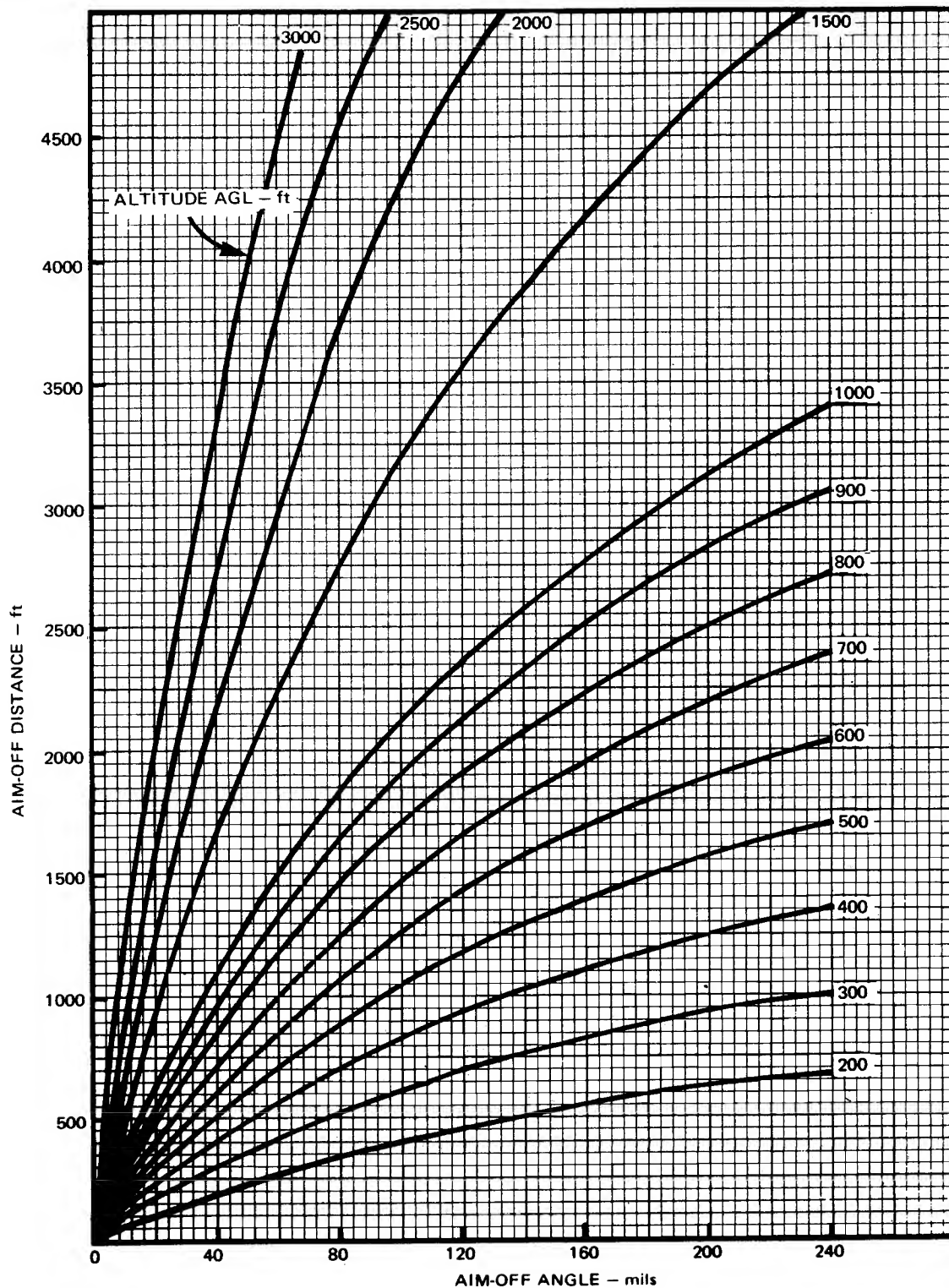


Figure 6-44



# Aim-off Distance Chart — 15° Dive Angle

SOURCE: USAF FIGHTER WEAPONS NEWSLETTER

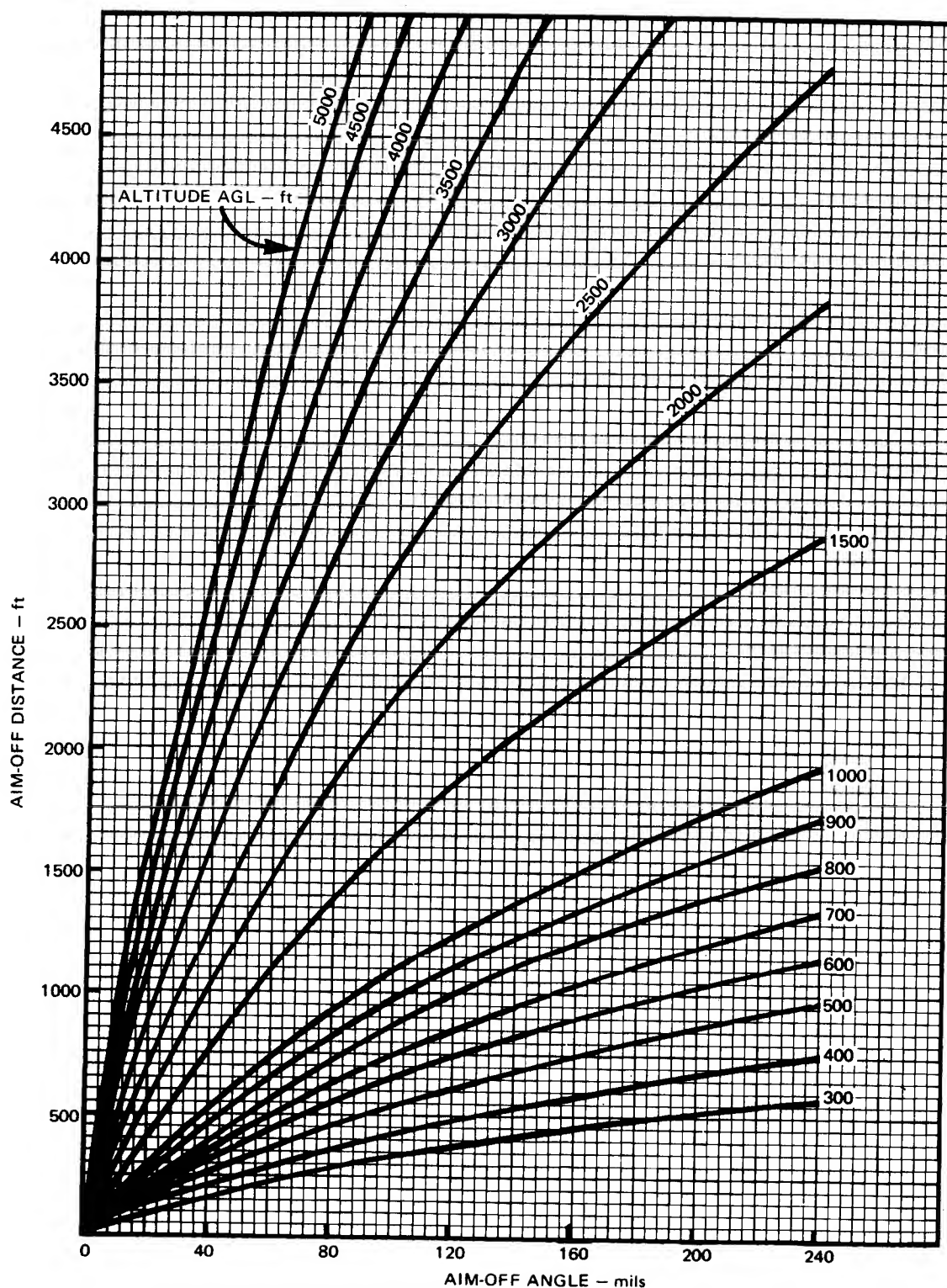


Figure 6-45

## Aim-off Distance Chart — 20° Dive Angle

SOURCE: USAF FIGHTER WEAPONS NEWSLETTER

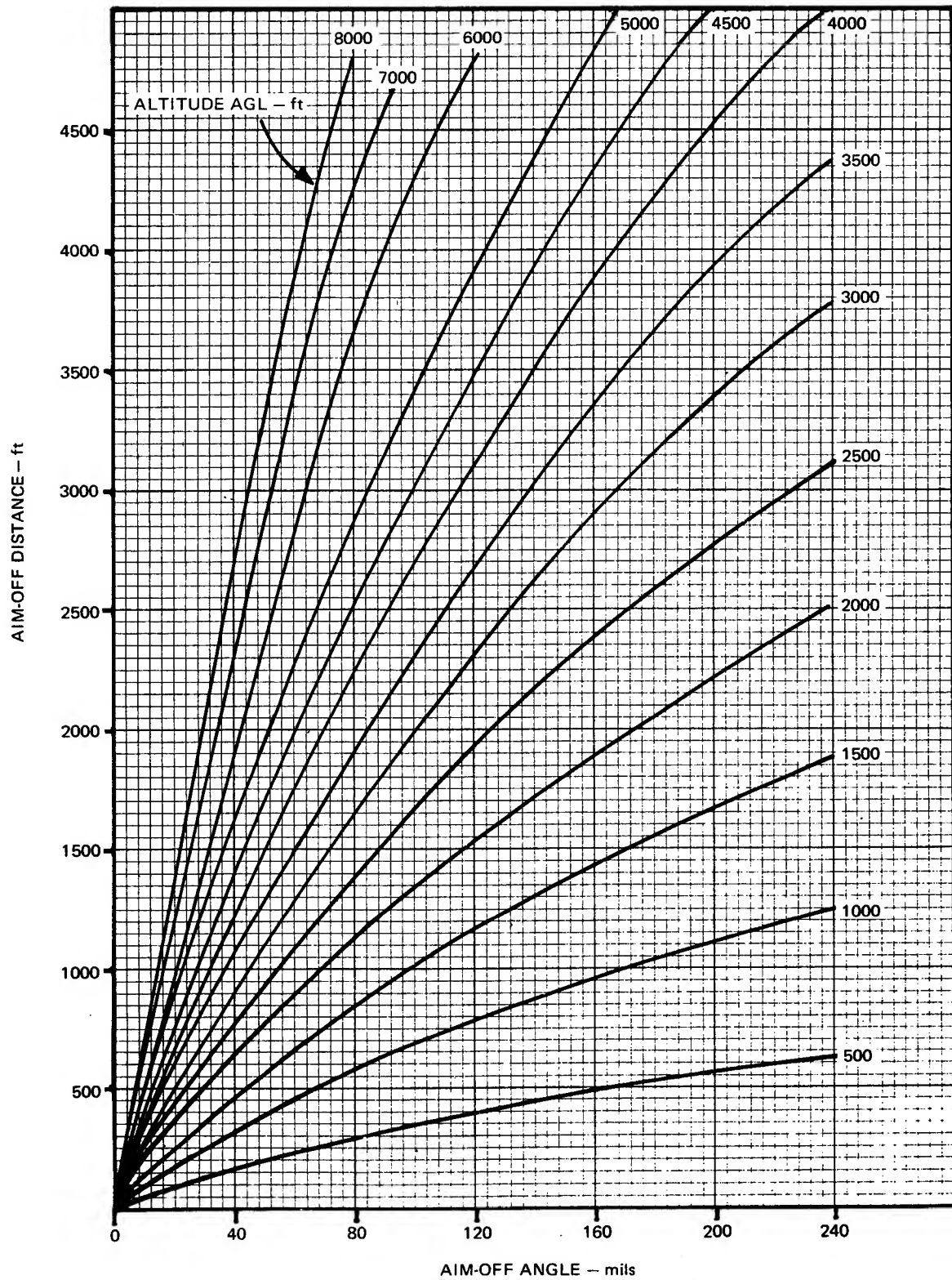


Figure 6-46

## ***Aim-off Distance Chart — 25° Dive Angle***

**TO BE ISSUED**

***Figure 6-47***

## Aim-off Distance Chart — 30° Dive Angle

SOURCE: USAF FIGHTER WEAPONS NEWSLETTER

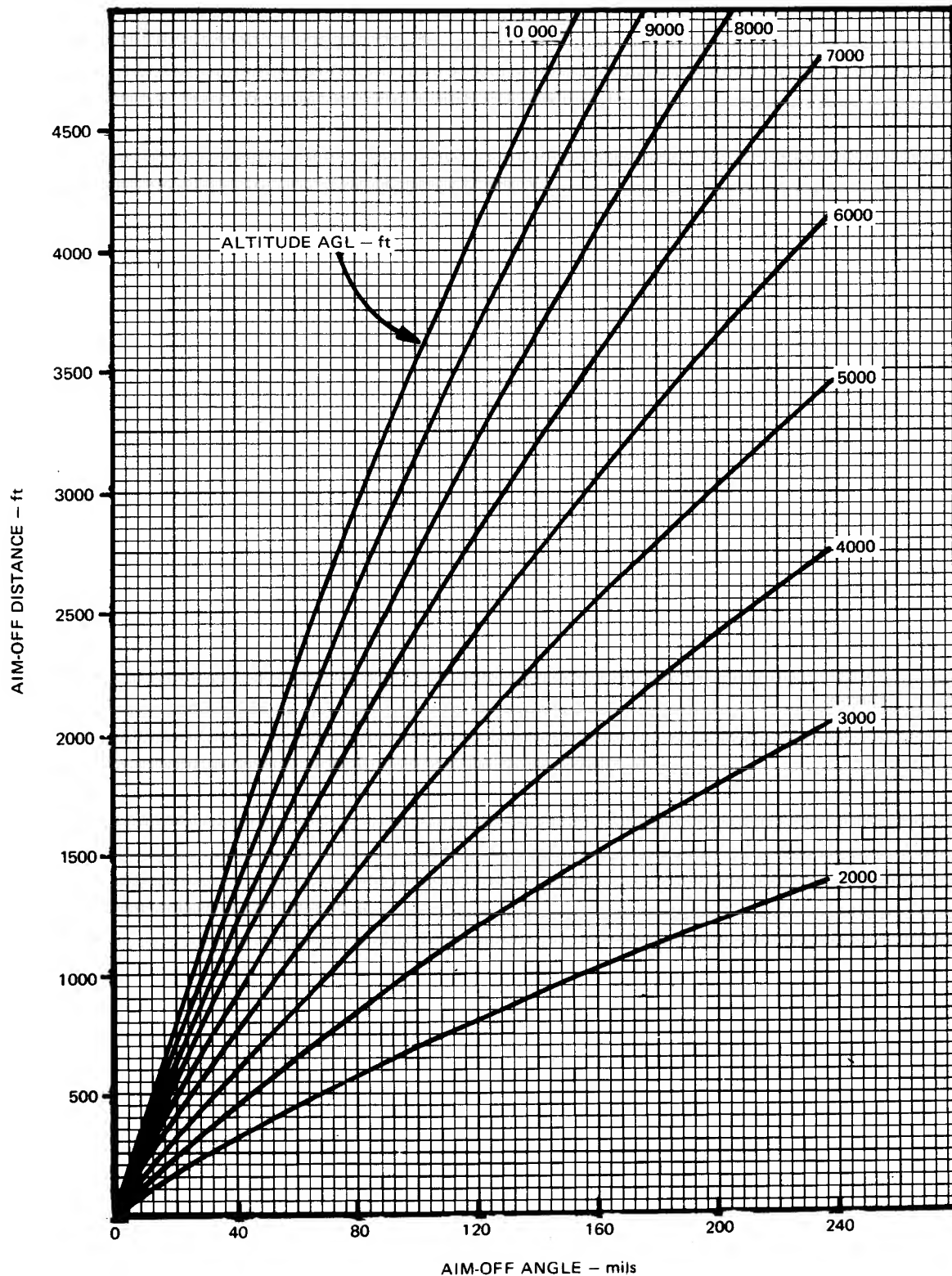


Figure 6-48

## ***Aim-off Distance Chart — 35° Dive Angle***

**TO BE ISSUED**

***Figure 6-49***

## ***Aim-off Distance Chart — 40° Dive Angle***

**TO BE ISSUED**

***Figure 6-50***

# Aim-off Distance Chart — 45° Dive Angle

SOURCE: USAF FIGHTER WEAPONS NEWSLETTER

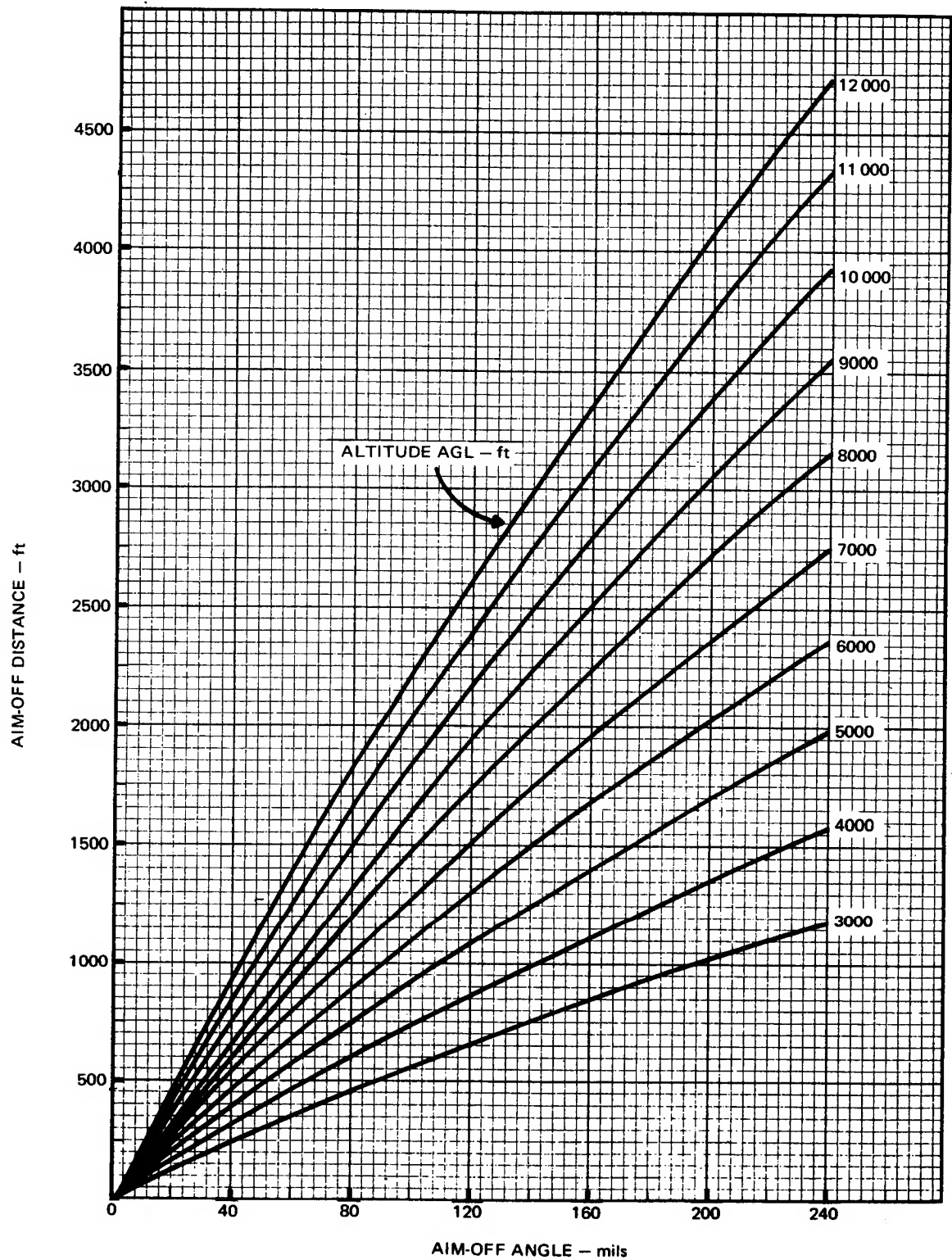


Figure 6-51

## ***Aim-off Distance Chart — 50° Dive Angle***

**TO BE ISSUED**

***Figure 6-52***



## ***Aim-off Distance Chart — 55° Dive Angle***

**TO BE ISSUED**

**Figure 6-53**

## ***Aim-off Distance Chart — 60° Dive Angle***

**TO BE ISSUED**

***Figure 6-54***

## Aim-off Distance Chart Geometry

KEY  
 AOA = Aim off angle  
 FP = Flight path  
 LOS = Line of sight

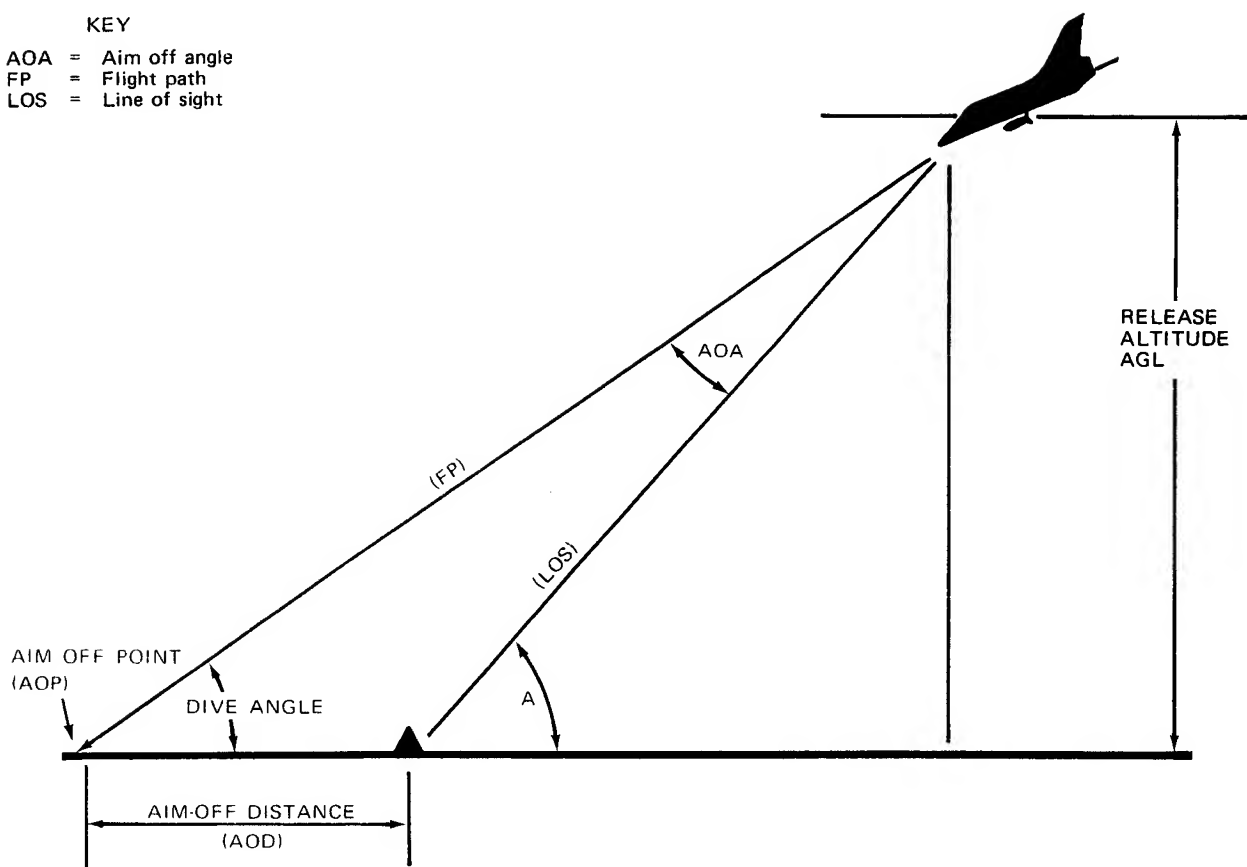
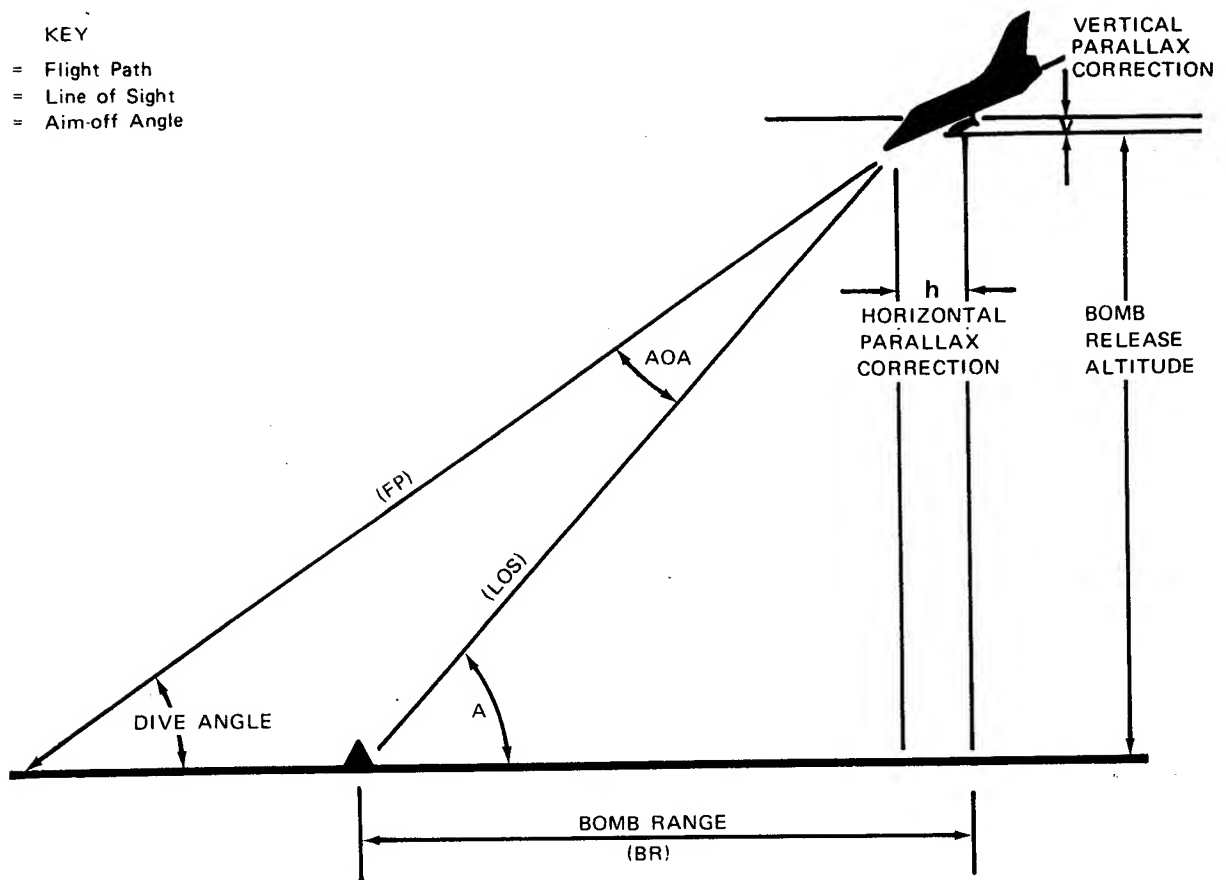


Figure 6-55

# Parallax Correction Table

KEY  
FP = Flight Path  
LOS = Line of Sight  
AOA = Aim-off Angle



DIVE ANGLE	CORRECTION TO	
	RELEASE ALTITUDE (v)	BOMB RANGE (h)
0°	+5	-18
5°	+3.4	-18.4
10°	+1.8	-18.5
15°	+0.2	-18.7
20°	-1.5	-18.6
25°	-3.1	-18.4
30°	-4.7	-18.1
35°	-6.2	-17.6
40°	-7.7	-17.0
45°	-9.2	-16.3
50°	-10.6	-15.4
55°	-11.9	-14.2
60°	-13.1	-13.3

Figure 6-56

# Bomb Spacing Chart — Low Drag Weapons

SOURCE: USN F4 Weapons Delivery Manual  
ACCURACY: Valid independent of TAS within the speeds shown. Small ballistics errors exist.  
STATUS: Interim  
NOTES: 1. Use release height and release airspeed of last bomb.  
2. Based on six bomb ripple release, MER-TER ejection velocity 5.6 ft/sec.

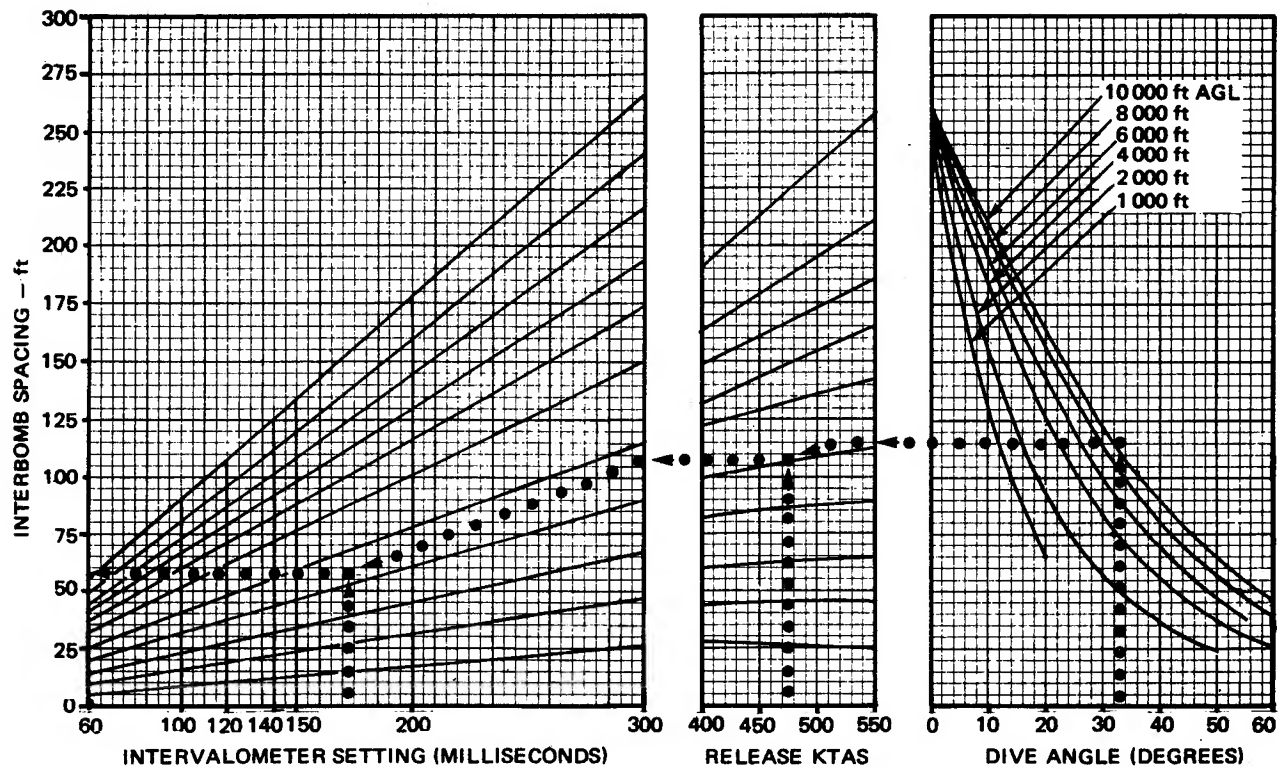


Figure 6-57

## Bomb Spacing Chart — High Drag Weapons

SOURCE: USN F4 Weapons Delivery Manual  
 ACCURACY: Valid independent of TAS within speeds as shown. Small ballistics errors exist.  
 STATUS: Interim  
 NOTES: 1. Use release height and release airspeed of last bomb  
 2. Based on six bomb ripple release, MER-TER ejection velocity 5.6 ft/sec.

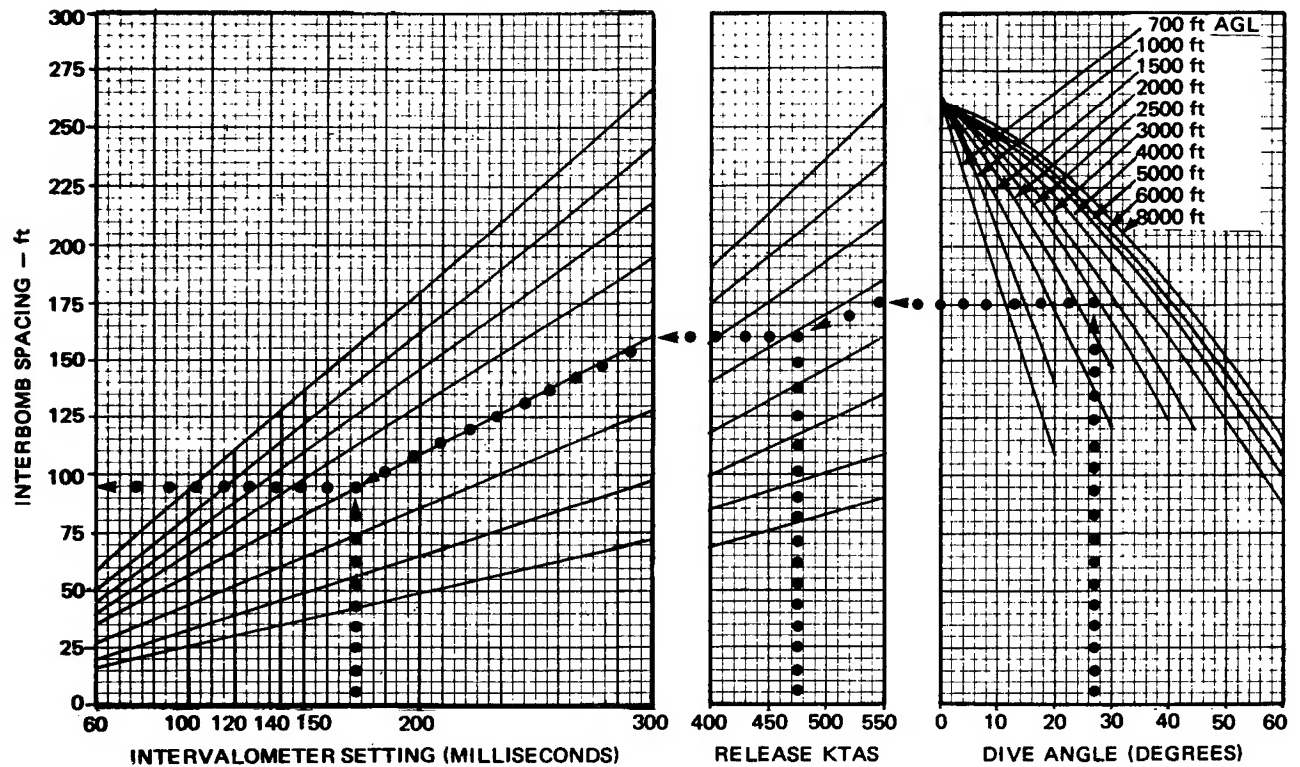


Figure 6-58

**Error Analysis Table**

TO BE ISSUED

**Figure 6-59**

## **Error Analysis Table**

**TO BE ISSUED**

**Figure 6-60**



**Error Analysis Table**

**TO BE ISSUED**

**Figure 6-61**

**TO BE ISSUED**

**Figure 6-62**

# Defa Gravity Drop Chart

30 mm DEFA -- GRAVITY  
DROP  
MUZZLE VELOCITY--  
815 m/sec  
SEA LEVEL  
T = TIME OF FLIGHT

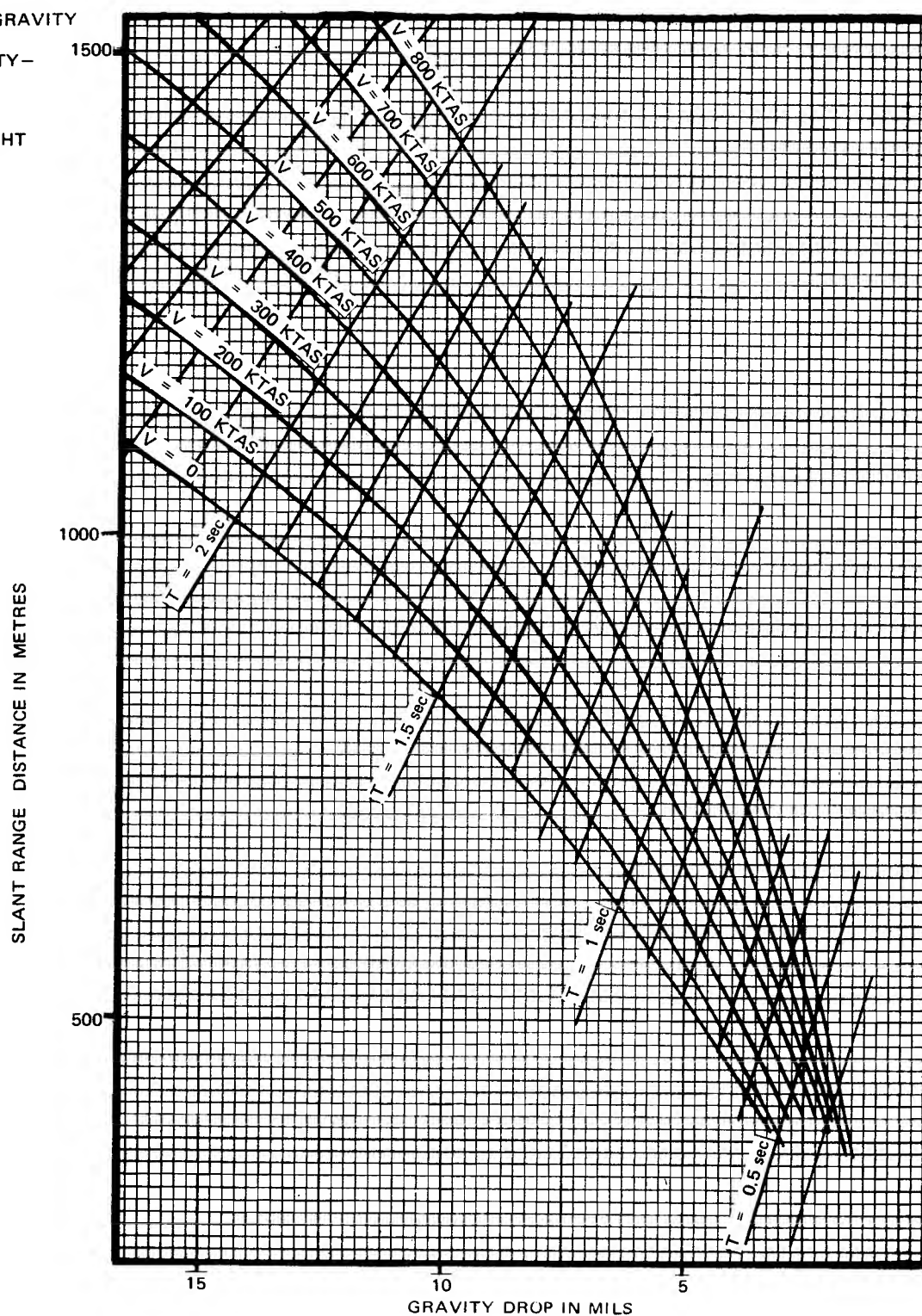


Figure 6-63

## Sight Depression Chart — AIR-GROUND GUNS

**SOURCE:** Avions Marcel Dassault — Air-to-ground Firing — Pilots Handbook DGT 9291

**ASSUMPTIONS:** Aircraft weight — 19 000 to 22 000 lb  
Load Factor — 1'g'  
No bombs remaining  
External fuel tanks empty  
Dive — 10° to 20°

**ACCURACY:** 1. At firing ranges below 700 m the graph gives depressions approximately 1 — 2mil greater than calculated figures  
2. At firing ranges above 700 m the graph gives depressions 3 — 4mils greater than calculated figures

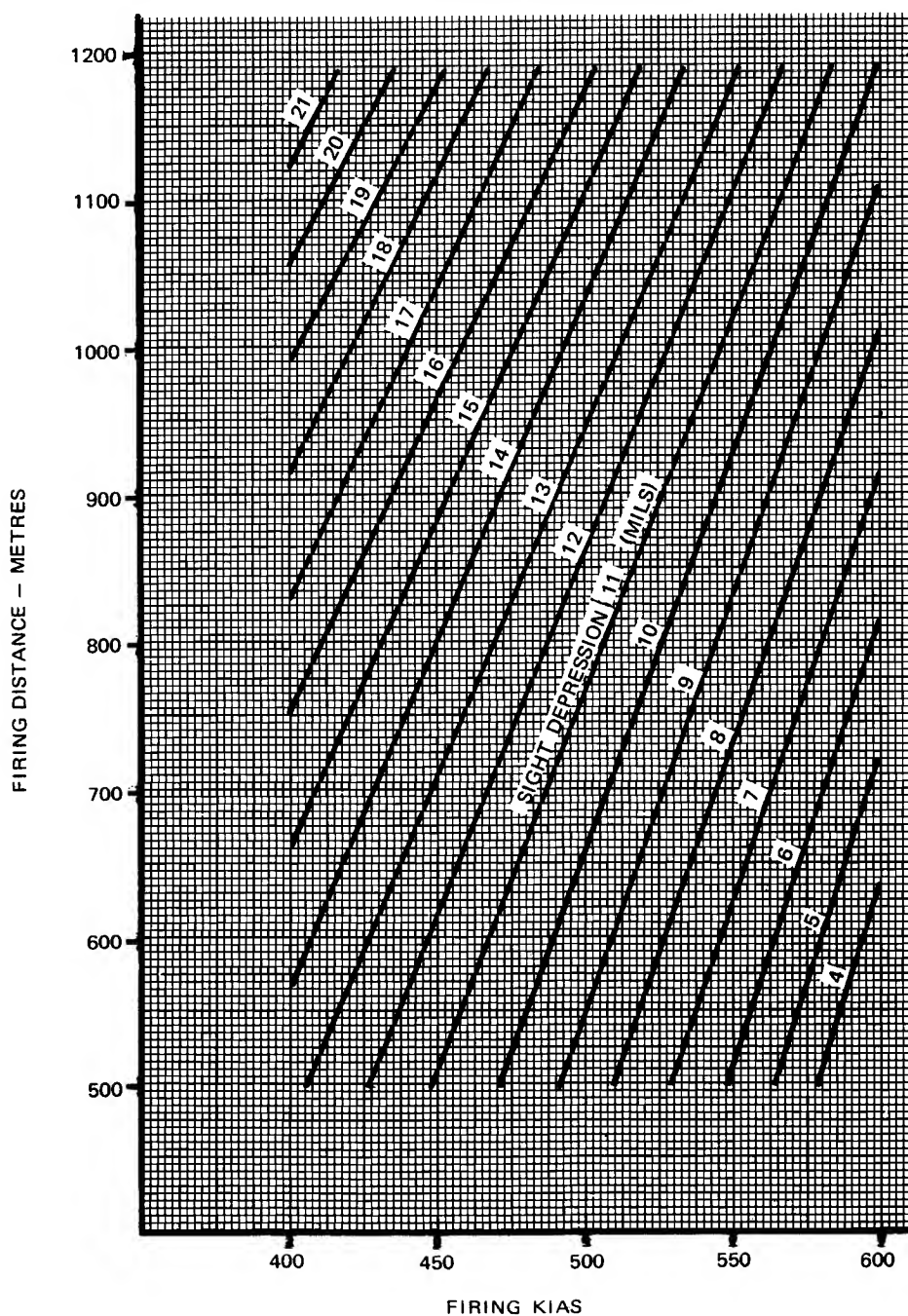


Figure 6-64

# Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	200	400	3.14	2079	2089	10	99	0.26	-0.24	2.54	5.3	0.1
0	200	420	3.14	2182	2191	9	94	0.23	-0.22	2.42	5.3	0.1
0	200	440	3.14	2284	2293	9	90	0.21	-0.20	2.31	5.3	0.1
0	200	460	3.14	2386	2395	9	86	0.19	-0.19	2.22	5.3	0.1
0	200	480	3.14	2489	2497	8	83	0.18	-0.17	2.13	5.3	0.1
0	200	500	3.14	2590	2598	8	79	0.17	-0.16	2.04	5.3	0.1
0	200	520	3.15	2691	2699	8	76	0.15	-0.15	1.97	5.3	0.1
0	200	540	3.15	2791	2798	7	74	0.14	-0.14	1.90	5.3	0.2
0	200	560	3.15	2887	2894	7	71	0.13	-0.13	1.84	5.3	0.2
0	200	580	3.16	2981	2987	7	69	0.13	-0.12	1.79	5.3	0.2
0	200	600	3.17	3071	3077	7	67	0.12	-0.11	1.74	5.4	0.2
0	300	400	3.93	2596	2613	12	118	0.31	-0.29	2.54	6.6	0.2
0	300	420	3.94	2724	2740	12	112	0.28	-0.27	2.43	6.7	0.2
0	300	440	3.94	2851	2867	11	107	0.25	-0.24	2.32	6.7	0.2
0	300	460	3.94	2978	2993	11	102	0.23	-0.22	2.22	6.7	0.2
0	300	480	3.94	3105	3120	10	98	0.21	-0.21	2.14	6.7	0.2
0	300	500	3.95	3232	3246	10	94	0.20	-0.19	2.05	6.7	0.2
0	300	520	3.95	3357	3370	9	91	0.18	-0.18	1.98	6.7	0.2
0	300	540	3.95	3480	3493	9	88	0.17	-0.16	1.91	6.7	0.2
0	300	560	3.96	3598	3611	9	85	0.16	-0.15	1.85	6.7	0.3
0	300	580	3.97	3712	3724	9	82	0.15	-0.15	1.80	6.7	0.3
0	300	600	3.98	3820	3832	8	80	0.14	-0.14	1.75	6.7	0.4
0	400	400	4.61	3030	3057	14	133	0.35	-0.33	2.55	7.8	0.2
0	400	420	4.61	3179	3204	13	127	0.32	-0.30	2.43	7.8	0.2
0	400	440	4.62	3327	3351	13	122	0.29	-0.28	2.33	7.8	0.2
0	400	460	4.62	3475	3498	12	116	0.27	-0.25	2.23	7.8	0.3
0	400	480	4.62	3623	3645	12	112	0.24	-0.23	2.14	7.8	0.3
0	400	500	4.63	3770	3791	11	107	0.23	-0.22	2.06	7.8	0.3
0	400	520	4.63	3915	3935	11	103	0.21	-0.20	1.99	7.8	0.3
0	400	540	4.63	4057	4077	11	100	0.20	-0.19	1.92	7.8	0.3
0	400	560	4.64	4193	4212	10	97	0.18	-0.18	1.86	7.8	0.4
0	400	580	4.65	4323	4341	10	94	0.17	-0.17	1.81	7.9	0.4
0	400	600	4.67	4446	4464	10	91	0.16	-0.16	1.77	7.9	0.5
0	500	400	5.21	3412	3448	16	148	0.39	-0.37	2.55	8.8	0.3
0	500	420	5.21	3579	3613	15	141	0.35	-0.33	2.44	8.8	0.3
0	500	440	5.22	3745	3778	14	135	0.32	-0.31	2.33	8.8	0.3
0	500	460	5.22	3911	3943	14	129	0.29	-0.28	2.24	8.8	0.3
0	500	480	5.22	4076	4107	13	124	0.27	-0.26	2.15	8.8	0.3
0	500	500	5.23	4241	4270	13	119	0.25	-0.24	2.07	8.8	0.4
0	500	520	5.23	4404	4432	12	115	0.23	-0.22	2.00	8.8	0.4
0	500	540	5.24	4562	4590	12	111	0.22	-0.21	1.93	8.9	0.4
0	500	560	5.25	4714	4740	11	107	0.20	-0.20	1.87	8.9	0.5
0	500	580	5.26	4857	4883	11	104	0.19	-0.19	1.82	8.9	0.5
0	500	600	5.28	4993	5018	11	101	0.18	-0.18	1.78	8.9	0.6
0	600	400	5.75	3755	3803	17	160	0.42	-0.40	2.56	9.7	0.3
0	600	420	5.76	3938	3984	16	153	0.38	-0.36	2.44	9.7	0.4
0	600	440	5.76	4121	4164	16	146	0.35	-0.33	2.34	9.7	0.4
0	600	460	5.77	4303	4345	15	140	0.32	-0.31	2.24	9.7	0.4
0	600	480	5.77	4484	4524	14	134	0.30	-0.28	2.16	9.8	0.4
0	600	500	5.77	4665	4704	14	129	0.27	-0.26	2.07	9.8	0.4
0	600	520	5.78	4843	4880	13	125	0.25	-0.24	2.00	9.8	0.5
0	600	540	5.79	5017	5053	13	120	0.24	-0.23	1.94	9.8	0.5
0	600	560	5.80	5182	5217	13	117	0.22	-0.21	1.88	9.8	0.5
0	600	580	5.81	5338	5371	12	113	0.21	-0.20	1.83	9.8	0.6
0	600	600	5.83	5484	5517	12	110	0.20	-0.19	1.79	9.8	0.7
0	700	400	6.25	4070	4130	18	172	0.45	-0.43	2.56	10.6	0.4
0	700	420	6.26	4268	4325	18	164	0.41	-0.39	2.45	10.6	0.4
0	700	440	6.26	4465	4520	17	157	0.37	-0.36	2.34	10.6	0.4
0	700	460	6.27	4662	4714	16	151	0.34	-0.33	2.25	10.6	0.5
0	700	480	6.27	4858	4909	16	145	0.32	-0.30	2.16	10.6	0.5
0	700	500	6.28	5054	5102	15	139	0.29	-0.28	2.08	10.6	0.5
0	700	520	6.28	5246	5292	15	134	0.27	-0.26	2.01	10.6	0.5
0	700	540	6.29	5433	5478	14	129	0.26	-0.25	1.94	10.6	0.6
0	700	560	6.30	5610	5654	14	125	0.24	-0.23	1.88	10.7	0.6
0	700	580	6.32	5777	5819	13	122	0.23	-0.22	1.84	10.7	0.7
0	700	600	6.34	5932	5974	13	119	0.22	-0.21	1.79	10.7	0.8

Figure 6-65 (Sheet 1 of 20)

## Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	800	400	5.72	4362	4435	20	183	0.48	-0.45	2.56	11.4	0.5
0	800	420	6.73	4574	4643	19	175	0.44	-0.42	2.45	11.4	0.5
0	800	440	6.73	4785	4851	18	167	0.40	-0.38	2.34	11.4	0.5
0	800	460	6.74	4995	5059	17	160	0.37	-0.35	2.25	11.4	0.5
0	800	480	6.74	5205	5266	17	154	0.34	-0.32	2.16	11.4	0.6
0	800	500	6.75	5414	5473	16	148	0.31	-0.30	2.08	11.4	0.6
0	800	520	6.76	5619	5675	16	143	0.29	-0.28	2.01	11.4	0.6
0	800	540	6.76	5813	5873	15	138	0.27	-0.26	1.95	11.4	0.7
0	800	560	6.78	6007	6050	15	134	0.26	-0.25	1.89	11.5	0.7
0	800	580	6.79	6183	6234	14	130	0.24	-0.23	1.84	11.5	0.8
0	800	600	6.81	6347	6398	14	126	0.23	-0.22	1.80	11.5	0.9
0	900	400	7.16	4636	4722	21	193	0.51	-0.48	2.56	12.1	0.5
0	900	420	7.17	4860	4943	20	185	0.46	-0.44	2.45	12.1	0.5
0	900	440	7.17	5084	5163	19	177	0.42	-0.40	2.35	12.1	0.6
0	900	460	7.18	5307	5383	18	169	0.39	-0.37	2.25	12.1	0.6
0	900	480	7.18	5529	5602	18	163	0.36	-0.34	2.17	12.1	0.6
0	900	500	7.19	5751	5821	17	156	0.33	-0.32	2.09	12.2	0.7
0	900	520	7.20	5968	6035	16	151	0.31	-0.30	2.02	12.2	0.7
0	900	540	7.21	6178	6244	16	146	0.29	-0.28	1.95	12.2	0.7
0	900	560	7.22	6377	6440	16	141	0.27	-0.26	1.89	12.2	0.8
0	900	580	7.24	6562	6624	15	137	0.26	-0.25	1.85	12.2	0.9
0	900	600	7.25	6735	6795	15	134	0.25	-0.24	1.81	12.3	1.0
0	1000	400	7.58	4894	4995	22	203	0.53	-0.50	2.56	12.8	0.6
0	1000	420	7.58	5130	5227	21	194	0.48	-0.46	2.45	12.8	0.6
0	1000	440	7.59	5366	5458	20	186	0.44	-0.42	2.35	12.8	0.6
0	1000	460	7.60	5601	5690	19	178	0.41	-0.39	2.26	12.8	0.7
0	1000	480	7.60	5835	5920	19	171	0.38	-0.36	2.17	12.9	0.7
0	1000	500	7.61	6068	6150	18	165	0.35	-0.34	2.09	12.9	0.7
0	1000	520	7.62	6296	6375	17	159	0.33	-0.31	2.02	12.9	0.8
0	1000	540	7.63	6518	6594	17	153	0.30	-0.29	1.96	12.9	0.8
0	1000	560	7.64	6726	6800	16	149	0.29	-0.28	1.90	12.9	0.9
0	1000	580	7.66	6920	6992	16	145	0.27	-0.26	1.85	13.0	1.0
0	1000	600	7.69	7099	7169	16	141	0.26	-0.25	1.81	13.0	1.2
0	1500	400	9.41	6015	6199	26	246	0.64	-0.61	2.56	15.9	0.9
0	1500	420	9.42	6304	6480	25	235	0.59	-0.56	2.46	15.9	0.9
0	1500	440	9.43	6591	6760	24	225	0.54	-0.51	2.36	15.9	1.0
0	1500	460	9.44	6877	7039	24	216	0.50	-0.47	2.27	15.9	1.0
0	1500	480	9.45	7162	7317	23	208	0.46	-0.44	2.18	16.0	1.0
0	1500	500	9.46	7445	7595	22	200	0.43	-0.41	2.10	16.0	1.1
0	1500	520	9.47	7722	7866	21	193	0.40	-0.38	2.03	16.0	1.2
0	1500	540	9.48	7988	8128	21	187	0.37	-0.36	1.97	16.0	1.2
0	1500	560	9.50	8237	8372	20	181	0.35	-0.34	1.92	16.1	1.4
0	1500	580	9.53	8465	8597	20	176	0.33	-0.32	1.87	16.1	1.5
0	1500	600	9.56	8675	8804	19	172	0.32	-0.31	1.83	16.2	1.7
0	2000	400	10.96	6950	7232	30	281	0.73	-0.69	2.56	18.5	1.2
0	2000	420	10.98	7282	7551	29	269	0.67	-0.64	2.46	18.5	1.2
0	2000	440	10.99	7612	7870	28	258	0.62	-0.59	2.36	18.6	1.3
0	2000	460	11.00	7940	8188	27	248	0.57	-0.54	2.27	18.6	1.3
0	2000	480	11.01	8266	8505	26	238	0.53	-0.51	2.19	18.6	1.4
0	2000	500	11.03	8590	8820	25	230	0.49	-0.47	2.11	18.6	1.5
0	2000	520	11.04	8906	9128	25	222	0.46	-0.44	2.04	18.7	1.5
0	2000	540	11.06	9209	9424	24	215	0.43	-0.41	1.98	18.7	1.6
0	2000	560	11.08	9490	9698	23	209	0.41	-0.39	1.93	18.7	1.8
0	2000	580	11.11	9745	9948	23	203	0.39	-0.37	1.89	18.8	2.0
0	2000	600	11.15	9978	10177	23	199	0.37	-0.36	1.85	18.8	2.2
0	2500	400	12.34	7767	8159	33	313	0.81	-0.77	2.56	20.9	1.4
0	2500	420	12.36	8136	8511	32	299	0.74	-0.71	2.45	20.9	1.5
0	2500	440	12.37	8502	8862	31	287	0.68	-0.65	2.36	20.9	1.6
0	2500	460	12.39	8866	9212	30	276	0.63	-0.61	2.27	20.9	1.7
0	2500	480	12.40	9229	9561	29	265	0.59	-0.56	2.19	21.0	1.7
0	2500	500	12.42	9588	9909	28	256	0.55	-0.53	2.12	21.0	1.9
0	2500	520	12.44	9938	10248	27	247	0.51	-0.49	2.05	21.0	1.9
0	2500	540	12.46	10271	10571	27	240	0.48	-0.46	1.99	21.1	2.0
0	2500	560	12.48	10579	10871	26	233	0.46	-0.44	1.94	21.1	2.2
0	2500	580	12.52	10857	11141	26	227	0.44	-0.42	1.90	21.2	2.4
0	2500	600	12.56	11109	11397	25	222	0.42	-0.40	1.86	21.2	2.7

Figure 6-65 (Sheet 2 of 20)

# Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	200	400	1.32	873	893	15	58	0.63	-0.62	2.50	2.2	0.0
10	200	420	1.29	884	906	14	54	0.59	-0.58	2.39	2.2	0.0
10	200	440	1.24	897	919	14	51	0.55	-0.54	2.28	2.1	0.0
10	200	460	1.20	908	930	14	48	0.52	-0.51	2.18	2.0	0.0
10	200	480	1.16	919	941	14	45	0.49	-0.48	2.09	2.0	0.0
10	200	500	1.13	923	950	13	43	0.46	-0.46	2.01	1.9	0.0
10	200	520	1.10	933	959	13	41	0.44	-0.44	1.93	1.9	0.0
10	200	540	1.07	947	963	13	39	0.42	-0.42	1.86	1.8	0.0
10	200	560	1.04	955	976	13	37	0.40	-0.40	1.80	1.8	0.0
10	200	580	1.01	962	983	13	35	0.38	-0.38	1.74	1.7	0.0
10	200	600	0.99	969	990	13	34	0.37	-0.36	1.69	1.7	0.0
10	300	400	1.93	1231	1267	16	59	0.63	-0.67	2.50	3.2	0.0
10	300	420	1.82	1254	1290	16	65	0.63	-0.62	2.39	3.1	0.0
10	300	440	1.77	1276	1311	15	61	0.59	-0.58	2.28	3.0	0.0
10	300	460	1.72	1296	1330	15	57	0.56	-0.55	2.18	2.9	0.0
10	300	480	1.67	1315	1349	15	54	0.52	-0.52	2.10	2.8	0.0
10	300	500	1.63	1332	1365	14	51	0.49	-0.49	2.01	2.7	0.0
10	300	520	1.58	1343	1381	14	48	0.47	-0.46	1.94	2.7	0.0
10	300	540	1.54	1363	1396	14	46	0.45	-0.44	1.87	2.6	0.0
10	300	560	1.51	1377	1409	14	44	0.42	-0.42	1.81	2.5	0.0
10	300	580	1.47	1390	1422	14	42	0.41	-0.40	1.75	2.5	0.1
10	300	600	1.44	1402	1434	13	40	0.39	-0.39	1.70	2.4	0.1
10	400	400	2.39	1560	1611	18	80	0.72	-0.70	2.51	4.0	0.1
10	400	420	2.32	1594	1643	17	75	0.67	-0.66	2.39	3.9	0.1
10	400	440	2.26	1625	1673	17	70	0.63	-0.62	2.28	3.8	0.1
10	400	460	2.20	1654	1701	16	66	0.59	-0.58	2.19	3.7	0.1
10	400	480	2.15	1681	1728	16	62	0.55	-0.54	2.10	3.6	0.1
10	400	500	2.09	1706	1752	15	59	0.52	-0.51	2.02	3.5	0.1
10	400	520	2.04	1730	1775	15	56	0.49	-0.49	1.94	3.4	0.1
10	400	540	1.99	1752	1797	15	53	0.47	-0.46	1.87	3.4	0.1
10	400	560	1.95	1772	1817	15	50	0.45	-0.44	1.81	3.3	0.1
10	400	580	1.91	1791	1835	14	48	0.43	-0.42	1.75	3.2	0.1
10	400	600	1.87	1809	1852	14	46	0.41	-0.40	1.70	3.2	0.1
10	500	400	2.86	1865	1931	19	90	0.76	-0.74	2.51	4.8	0.1
10	500	420	2.79	1903	1973	18	85	0.71	-0.69	2.39	4.7	0.1
10	500	440	2.72	1949	2012	18	79	0.66	-0.65	2.29	4.6	0.1
10	500	460	2.66	1987	2049	17	75	0.62	-0.61	2.19	4.5	0.1
10	500	480	2.59	2023	2094	17	71	0.59	-0.57	2.10	4.4	0.1
10	500	500	2.53	2057	2116	16	67	0.55	-0.54	2.02	4.3	0.1
10	500	520	2.47	2088	2147	16	63	0.52	-0.51	1.95	4.2	0.1
10	500	540	2.42	2117	2176	16	60	0.49	-0.48	1.88	4.1	0.1
10	500	560	2.37	2144	2202	15	57	0.47	-0.46	1.82	4.0	0.1
10	500	580	2.32	2170	2226	15	54	0.45	-0.44	1.76	3.9	0.1
10	500	600	2.28	2193	2249	15	52	0.43	-0.42	1.71	3.8	0.1
10	600	400	3.31	2150	2232	20	100	0.79	-0.77	2.51	5.6	0.1
10	600	420	3.23	2203	2293	19	94	0.74	-0.72	2.39	5.5	0.1
10	600	440	3.16	2253	2332	19	88	0.69	-0.67	2.29	5.3	0.1
10	600	460	3.08	2300	2377	18	83	0.64	-0.63	2.19	5.2	0.1
10	600	480	3.01	2345	2420	18	78	0.60	-0.59	2.10	5.1	0.1
10	600	500	2.95	2387	2461	17	74	0.57	-0.56	2.02	5.0	0.1
10	600	520	2.88	2426	2499	17	70	0.54	-0.53	1.95	4.9	0.1
10	600	540	2.82	2463	2535	17	67	0.51	-0.50	1.89	4.8	0.1
10	600	560	2.77	2497	2568	16	63	0.49	-0.48	1.82	4.7	0.1
10	600	580	2.72	2529	2599	16	61	0.46	-0.46	1.77	4.6	0.2
10	600	600	2.67	2558	2627	16	58	0.45	-0.44	1.72	4.5	0.2
10	700	400	3.73	2418	2517	21	110	0.82	-0.80	2.51	6.3	0.2
10	700	420	3.65	2481	2578	20	103	0.76	-0.75	2.39	6.2	0.2
10	700	440	3.57	2540	2635	20	97	0.71	-0.70	2.29	6.0	0.2
10	700	460	3.49	2597	2689	19	91	0.67	-0.65	2.19	5.9	0.2
10	700	480	3.42	2650	2741	19	86	0.63	-0.61	2.11	5.8	0.2
10	700	500	3.34	2700	2790	18	81	0.59	-0.58	2.03	5.6	0.2
10	700	520	3.27	2749	2835	18	77	0.56	-0.55	1.95	5.5	0.2
10	700	540	3.21	2792	2878	17	73	0.53	-0.52	1.88	5.4	0.2
10	700	560	3.15	2833	2918	17	70	0.50	-0.50	1.83	5.3	0.2
10	700	580	3.10	2871	2955	17	67	0.48	-0.47	1.77	5.2	0.2
10	700	600	3.05	2906	2989	16	64	0.46	-0.46	1.72	5.2	0.2

Figure 6-65 (Sheet 3 of 20)

## Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	800	400	4.13	2672	2739	22	119	0.85	-0.83	2.50	7.0	0.2
10	800	420	4.05	2744	2858	21	111	0.79	-0.77	2.39	6.8	0.2
10	800	440	3.96	2813	2924	21	105	0.74	-0.72	2.29	6.7	0.2
10	800	460	3.88	2878	2997	20	99	0.69	-0.68	2.19	6.6	0.2
10	800	480	3.80	2940	3047	19	93	0.65	-0.64	2.11	6.4	0.2
10	800	500	3.72	2993	3104	19	88	0.61	-0.60	2.03	6.3	0.2
10	800	520	3.65	3054	3157	18	84	0.58	-0.57	1.95	6.2	0.2
10	800	540	3.58	3106	3207	18	79	0.55	-0.54	1.89	6.1	0.2
10	800	560	3.52	3153	3253	18	76	0.52	-0.51	1.83	6.0	0.2
10	800	580	3.47	3197	3296	17	72	0.50	-0.49	1.78	5.9	0.3
10	800	600	3.41	3238	3336	17	69	0.48	-0.47	1.73	5.8	0.3
10	900	400	4.52	2913	3049	23	127	0.88	-0.86	2.50	7.6	0.2
10	900	420	4.43	2995	3127	22	119	0.82	-0.80	2.39	7.5	0.2
10	900	440	4.34	3073	3202	21	112	0.76	-0.74	2.29	7.3	0.2
10	900	460	4.25	3147	3273	21	106	0.71	-0.70	2.20	7.2	0.2
10	900	480	4.17	3217	3341	20	100	0.67	-0.65	2.11	7.0	0.2
10	900	500	4.09	3284	3405	20	95	0.63	-0.62	2.03	6.9	0.2
10	900	520	4.01	3347	3466	19	90	0.59	-0.58	1.96	6.8	0.2
10	900	540	3.94	3406	3523	19	85	0.56	-0.55	1.89	6.7	0.3
10	900	560	3.88	3461	3576	18	82	0.54	-0.53	1.83	6.6	0.3
10	900	580	3.82	3511	3625	18	78	0.51	-0.50	1.78	6.5	0.3
10	900	600	3.77	3558	3670	18	75	0.49	-0.48	1.73	6.4	0.3
10	1000	400	4.89	3144	3299	24	135	0.90	-0.88	2.50	8.3	0.3
10	1000	420	4.79	3235	3386	23	127	0.84	-0.82	2.39	8.1	0.3
10	1000	440	4.70	3321	3469	22	120	0.78	-0.76	2.29	7.9	0.3
10	1000	460	4.61	3404	3548	22	113	0.73	-0.72	2.20	7.8	0.3
10	1000	480	4.53	3483	3624	21	107	0.69	-0.67	2.11	7.6	0.3
10	1000	500	4.44	3558	3696	20	101	0.65	-0.63	2.03	7.5	0.3
10	1000	520	4.36	3629	3764	20	96	0.61	-0.60	1.96	7.4	0.3
10	1000	540	4.29	3695	3828	19	91	0.58	-0.57	1.89	7.2	0.3
10	1000	560	4.22	3756	3887	19	87	0.55	-0.54	1.84	7.1	0.3
10	1000	580	4.16	3812	3941	19	83	0.53	-0.52	1.78	7.0	0.4
10	1000	600	4.11	3865	3992	18	80	0.51	-0.50	1.74	6.9	0.4
10	1500	400	6.55	4173	4435	28	172	1.01	-0.99	2.50	11.1	0.5
10	1500	420	6.45	4307	4560	27	162	0.94	-0.91	2.39	10.9	0.5
10	1500	440	6.34	4435	4682	26	153	0.88	-0.85	2.29	10.7	0.5
10	1500	460	6.24	4558	4798	25	145	0.82	-0.80	2.20	10.6	0.5
10	1500	480	6.15	4676	4911	24	137	0.77	-0.75	2.12	10.4	0.5
10	1500	500	6.05	4790	5019	24	130	0.72	-0.71	2.04	10.2	0.5
10	1500	520	5.96	4897	5122	23	124	0.68	-0.67	1.97	10.1	0.5
10	1500	540	5.88	4998	5218	23	118	0.65	-0.63	1.90	9.9	0.5
10	1500	560	5.81	5090	5306	22	113	0.62	-0.61	1.85	9.8	0.6
10	1500	580	5.74	5174	5387	22	109	0.59	-0.58	1.80	9.7	0.6
10	1500	600	5.69	5252	5462	21	105	0.57	-0.56	1.76	9.6	0.7
10	2000	400	8.00	5055	5436	31	204	1.10	-1.06	2.49	13.5	0.7
10	2000	420	7.89	5226	5536	30	192	1.02	-0.99	2.38	13.3	0.7
10	2000	440	7.78	5392	5751	29	182	0.95	-0.93	2.29	13.2	0.7
10	2000	460	7.68	5551	5900	28	173	0.89	-0.87	2.20	13.0	0.7
10	2000	480	7.57	5705	6046	27	164	0.84	-0.82	2.12	12.8	0.7
10	2000	500	7.47	5853	6186	27	156	0.79	-0.77	2.04	12.6	0.7
10	2000	520	7.38	5994	6319	26	149	0.74	-0.73	1.97	12.5	0.8
10	2000	540	7.29	6126	6444	25	142	0.71	-0.69	1.91	12.3	0.8
10	2000	560	7.22	6246	6558	25	136	0.67	-0.66	1.86	12.2	0.9
10	2000	580	7.15	6355	6662	24	131	0.65	-0.63	1.81	12.1	1.0
10	2000	600	7.10	6455	6758	24	127	0.62	-0.61	1.78	12.0	1.1
10	2500	400	9.31	5837	6350	34	231	1.17	-1.13	2.48	15.7	0.9
10	2500	420	9.19	6042	6539	33	219	1.09	-1.06	2.38	15.5	0.9
10	2500	440	9.08	6241	6723	32	208	1.02	-0.99	2.29	15.3	0.9
10	2500	460	8.97	6434	6902	31	197	0.95	-0.93	2.20	15.2	1.0
10	2500	480	8.87	6620	7076	30	188	0.89	-0.87	2.12	15.0	1.0
10	2500	500	8.76	6800	7245	29	179	0.84	-0.82	2.04	14.8	1.0
10	2500	520	8.66	6971	7406	28	171	0.80	-0.78	1.98	14.6	1.0
10	2500	540	8.57	7130	7556	28	164	0.76	-0.74	1.92	14.5	1.1
10	2500	560	8.50	7275	7693	27	157	0.72	-0.71	1.87	14.4	1.2
10	2500	580	8.44	7406	7817	27	152	0.69	-0.68	1.82	14.3	1.3
10	2500	600	8.39	7526	7930	26	147	0.67	-0.65	1.79	14.2	1.4

**Figure 6-65 (Sheet 4 of 20)**



# Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	3000	400	10.51	6544	7199	37	256	1.23	-1.19	2.47	17.8	1.1
10	3000	420	10.39	6781	7415	35	243	1.15	-1.11	2.37	17.6	1.2
10	3000	440	10.28	7011	7626	34	231	1.07	-1.04	2.28	17.4	1.2
10	3000	460	10.16	7234	7831	33	220	1.01	-0.98	2.19	17.2	1.2
10	3000	480	10.05	7450	8032	32	209	0.94	-0.92	2.12	17.0	1.2
10	3000	500	9.95	7660	8226	31	200	0.89	-0.87	2.04	16.8	1.3
10	3000	520	9.85	7853	8411	31	191	0.84	-0.82	1.98	16.6	1.3
10	3000	540	9.76	8042	8534	30	183	0.80	-0.78	1.92	16.5	1.4
10	3000	560	9.69	8210	8741	29	177	0.77	-0.75	1.87	16.4	1.5
10	3000	580	9.63	8360	8932	29	171	0.74	-0.72	1.83	16.3	1.6
10	3000	600	9.58	8497	9011	28	166	0.71	-0.69	1.80	16.2	1.8
10	3500	400	11.62	7195	8001	39	273	1.29	-1.25	2.45	19.6	1.4
10	3500	420	11.50	7460	8241	38	265	1.20	-1.16	2.36	19.4	1.4
10	3500	440	11.39	7713	8475	36	252	1.12	-1.09	2.27	19.2	1.4
10	3500	460	11.27	7970	8704	35	240	1.05	-1.02	2.19	19.1	1.5
10	3500	480	11.16	8214	8929	34	229	0.99	-0.96	2.11	18.9	1.5
10	3500	500	11.06	8450	9147	33	219	0.93	-0.91	2.04	18.7	1.5
10	3500	520	10.96	8674	9354	33	210	0.88	-0.85	1.98	18.5	1.6
10	3500	540	10.87	8882	9546	32	202	0.84	-0.82	1.92	18.4	1.7
10	3500	560	10.80	9069	9721	31	195	0.80	-0.79	1.88	18.3	1.8
10	3500	580	10.75	9236	9877	31	188	0.77	-0.76	1.84	18.2	2.0
10	3500	600	10.70	9388	10020	30	183	0.75	-0.73	1.80	18.1	2.2
10	4000	400	12.67	7800	8766	41	300	1.33	-1.29	2.44	21.4	1.6
10	4000	420	12.55	8092	9027	40	290	1.25	-1.21	2.35	21.2	1.6
10	4000	440	12.43	8377	9283	38	272	1.17	-1.13	2.26	21.0	1.7
10	4000	460	12.32	8654	9534	37	259	1.09	-1.06	2.18	20.8	1.7
10	4000	480	12.21	8925	9780	36	248	1.03	-1.00	2.11	20.6	1.7
10	4000	500	12.10	9186	10019	35	237	0.97	-0.95	2.04	20.4	1.8
10	4000	520	12.00	9433	10246	34	227	0.92	-0.90	1.98	20.3	1.9
10	4000	540	11.92	9662	10457	34	219	0.88	-0.86	1.93	20.1	2.0
10	4000	560	11.85	9867	10647	33	211	0.84	-0.82	1.88	20.0	2.1
10	4000	580	11.80	10049	10816	33	205	0.81	-0.79	1.84	19.9	2.3
10	4000	600	11.76	10216	10971	32	199	0.78	-0.77	1.81	19.9	2.6
10	4500	400	13.66	8367	9500	43	320	1.38	-1.33	2.43	23.1	1.8
10	4500	420	13.54	8684	9731	41	305	1.29	-1.25	2.34	22.9	1.9
10	4500	440	13.42	8994	10057	40	290	1.21	-1.17	2.26	22.7	1.9
10	4500	460	13.31	9296	10328	39	277	1.13	-1.10	2.18	22.5	2.0
10	4500	480	13.20	9591	10594	38	265	1.07	-1.04	2.11	22.3	2.0
10	4500	500	13.09	9875	10852	37	254	1.01	-0.98	2.04	22.1	2.1
10	4500	520	12.99	10145	11098	36	244	0.96	-0.93	1.98	22.0	2.1
10	4500	540	12.91	10392	11325	35	235	0.91	-0.89	1.93	21.8	2.3
10	4500	560	12.85	10614	11529	35	227	0.87	-0.85	1.88	21.7	2.5
10	4500	580	12.80	10811	11710	34	221	0.84	-0.82	1.85	21.6	2.7
10	4500	600	12.76	10990	11876	34	215	0.82	-0.80	1.82	21.6	3.0
10	5000	400	14.60	8902	10210	44	338	1.42	-1.37	2.42	24.7	2.1
10	5000	420	14.48	9243	10509	43	322	1.32	-1.28	2.33	24.5	2.1
10	5000	440	14.37	9577	10803	42	308	1.24	-1.21	2.25	24.3	2.2
10	5000	460	14.25	9902	11093	41	294	1.17	-1.14	2.17	24.1	2.2
10	5000	480	14.14	10220	11379	40	281	1.10	-1.07	2.10	23.9	2.3
10	5000	500	14.03	10526	11653	39	270	1.04	-1.01	2.04	23.7	2.3
10	5000	520	13.94	10816	11916	38	259	0.99	-0.96	1.98	23.6	2.4
10	5000	540	13.86	11082	12157	37	250	0.94	-0.92	1.93	23.4	2.6
10	5000	560	13.80	11318	12373	36	242	0.90	-0.88	1.88	23.3	2.8
10	5000	580	13.76	11528	12565	36	235	0.87	-0.85	1.85	23.3	3.1
10	5000	600	13.72	11719	12741	35	229	0.85	-0.83	1.82	23.2	3.4
10	5500	400	15.50	9409	10899	46	355	1.45	-1.41	2.40	26.2	2.3
10	5500	420	15.38	9774	11215	44	339	1.36	-1.32	2.32	26.0	2.4
10	5500	440	15.27	10130	11526	43	324	1.27	-1.24	2.24	25.8	2.4
10	5500	460	15.16	10477	11833	42	310	1.20	-1.17	2.16	25.6	2.5
10	5500	480	15.04	10817	12135	41	297	1.13	-1.10	2.09	25.4	2.5
10	5500	500	14.94	11143	12427	40	285	1.07	-1.04	2.03	25.2	2.6
10	5500	520	14.85	11454	12706	39	274	1.02	-0.99	1.97	25.1	2.7
10	5500	540	14.77	11735	12960	38	264	0.97	-0.95	1.93	25.0	2.9
10	5500	560	14.72	11985	13187	38	256	0.93	-0.91	1.89	24.9	3.1
10	5500	580	14.68	12206	13388	37	249	0.90	-0.88	1.85	24.8	3.4
10	5500	600	14.65	12408	13572	37	243	0.87	-0.85	1.82	24.8	3.8

Figure 6-65 (Sheet 5 of 20)

## Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	200	400	0.99	636	667	19	51	0.81	-0.80	2.50	1.7	0.0
15	200	420	0.95	643	673	19	48	0.76	-0.75	2.38	1.6	0.0
15	200	440	0.91	648	679	18	45	0.72	-0.71	2.27	1.5	0.0
15	200	460	0.88	654	684	18	43	0.68	-0.67	2.18	1.5	0.0
15	200	480	0.85	659	688	18	41	0.65	-0.64	2.09	1.4	0.0
15	200	500	0.82	663	693	18	39	0.61	-0.61	2.00	1.4	0.0
15	200	520	0.80	667	697	18	37	0.59	-0.58	1.93	1.3	0.0
15	200	540	0.77	671	700	17	35	0.56	-0.56	1.86	1.3	0.0
15	200	560	0.75	674	703	17	34	0.54	-0.53	1.79	1.3	0.0
15	200	580	0.73	678	706	17	32	0.52	-0.51	1.73	1.2	0.0
15	200	600	0.71	681	709	17	31	0.50	-0.49	1.68	1.2	0.0
15	300	400	1.43	921	968	20	59	0.85	-0.84	2.50	2.4	0.0
15	300	420	1.38	932	979	20	55	0.80	-0.79	2.38	2.3	0.0
15	300	440	1.33	943	989	19	52	0.75	-0.74	2.27	2.3	0.0
15	300	460	1.29	952	998	19	49	0.71	-0.70	2.18	2.2	0.0
15	300	480	1.24	961	1007	19	46	0.67	-0.67	2.09	2.1	0.0
15	300	500	1.20	969	1014	19	44	0.64	-0.63	2.01	2.0	0.0
15	300	520	1.17	976	1021	18	41	0.61	-0.60	1.93	2.0	0.0
15	300	540	1.13	983	1028	18	39	0.58	-0.58	1.86	1.9	0.0
15	300	560	1.10	989	1034	18	38	0.56	-0.55	1.80	1.9	0.0
15	300	580	1.07	995	1039	18	36	0.53	-0.53	1.74	1.8	0.0
15	300	600	1.04	1000	1044	18	34	0.51	-0.51	1.69	1.8	0.0
15	400	400	1.85	1188	1254	21	67	0.89	-0.88	2.50	3.1	0.1
15	400	420	1.79	1206	1270	21	63	0.83	-0.82	2.38	3.0	0.1
15	400	440	1.73	1221	1285	20	59	0.78	-0.77	2.28	2.9	0.1
15	400	460	1.67	1236	1299	20	55	0.74	-0.73	2.18	2.8	0.0
15	400	480	1.62	1249	1311	20	52	0.70	-0.69	2.09	2.7	0.0
15	400	500	1.57	1261	1323	19	49	0.66	-0.66	2.01	2.7	0.0
15	400	520	1.53	1272	1334	19	47	0.63	-0.62	1.93	2.6	0.0
15	400	540	1.48	1283	1344	19	44	0.60	-0.60	1.86	2.5	0.0
15	400	560	1.44	1292	1353	19	42	0.57	-0.57	1.80	2.4	0.0
15	400	580	1.41	1301	1361	18	40	0.55	-0.55	1.74	2.4	0.1
15	400	600	1.37	1309	1369	18	39	0.53	-0.53	1.69	2.3	0.1
15	500	400	2.25	1442	1526	22	76	0.93	-0.91	2.49	3.8	0.1
15	500	420	2.18	1465	1548	22	71	0.87	-0.85	2.38	3.7	0.1
15	500	440	2.11	1487	1568	21	66	0.81	-0.80	2.28	3.6	0.1
15	500	460	2.05	1506	1587	21	62	0.77	-0.75	2.18	3.5	0.1
15	500	480	1.99	1525	1605	20	59	0.72	-0.71	2.09	3.4	0.1
15	500	500	1.93	1541	1621	20	55	0.68	-0.68	2.01	3.3	0.1
15	500	520	1.87	1557	1635	20	52	0.65	-0.64	1.93	3.2	0.1
15	500	540	1.82	1571	1649	19	50	0.62	-0.61	1.87	3.1	0.1
15	500	560	1.77	1584	1661	19	47	0.59	-0.59	1.80	3.0	0.1
15	500	580	1.73	1596	1673	19	45	0.57	-0.56	1.75	2.9	0.1
15	500	600	1.69	1608	1684	19	43	0.55	-0.54	1.70	2.9	0.1
15	600	400	2.64	1683	1787	23	84	0.96	-0.94	2.49	4.5	0.1
15	600	420	2.56	1713	1815	22	78	0.89	-0.88	2.38	4.3	0.1
15	600	440	2.48	1740	1841	22	73	0.84	-0.83	2.28	4.2	0.1
15	600	460	2.41	1766	1865	21	69	0.79	-0.78	2.18	4.1	0.1
15	600	480	2.34	1789	1887	21	65	0.75	-0.73	2.09	3.9	0.1
15	600	500	2.27	1811	1908	21	61	0.71	-0.70	2.01	3.8	0.1
15	600	520	2.21	1831	1927	20	58	0.67	-0.66	1.94	3.7	0.1
15	600	540	2.15	1850	1944	20	55	0.64	-0.63	1.87	3.6	0.1
15	600	560	2.10	1867	1961	20	52	0.61	-0.60	1.81	3.5	0.1
15	600	580	2.05	1882	1975	20	50	0.58	-0.58	1.75	3.5	0.1
15	600	600	2.00	1897	1989	19	47	0.56	-0.56	1.70	3.4	0.1
15	700	400	3.01	1914	2038	24	92	0.99	-0.97	2.49	5.1	0.1
15	700	420	2.92	1950	2072	23	86	0.92	-0.91	2.38	4.9	0.1
15	700	440	2.83	1984	2104	23	80	0.86	-0.85	2.28	4.8	0.1
15	700	460	2.75	2015	2133	22	75	0.81	-0.80	2.18	4.7	0.1
15	700	480	2.68	2044	2160	22	71	0.77	-0.76	2.09	4.5	0.1
15	700	500	2.60	2071	2186	21	67	0.72	-0.71	2.01	4.4	0.1
15	700	520	2.54	2096	2209	21	63	0.69	-0.68	1.94	4.3	0.1
15	700	540	2.47	2119	2231	21	60	0.65	-0.65	1.87	4.2	0.1
15	700	560	2.41	2140	2251	20	57	0.63	-0.62	1.81	4.1	0.1
15	700	580	2.36	2159	2270	20	54	0.60	-0.59	1.76	4.0	0.1
15	700	600	2.31	2177	2286	20	52	0.58	-0.57	1.71	3.9	0.1

**Figure 6-65 (Sheet 6 of 20)**

# Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	800	400	3.36	2135	2280	25	99	1.01	-0.99	2.49	5.7	0.2
15	800	420	3.26	2178	2320	24	93	0.95	-0.93	2.38	5.5	0.1
15	800	440	3.17	2218	2358	24	87	0.89	-0.87	2.27	5.4	0.1
15	800	460	3.09	2255	2393	23	82	0.83	-0.82	2.18	5.2	0.1
15	800	480	3.01	2290	2425	22	77	0.79	-0.77	2.09	5.1	0.1
15	800	500	2.93	2322	2456	22	72	0.74	-0.73	2.01	4.9	0.1
15	800	520	2.85	2352	2484	22	68	0.70	-0.70	1.94	4.8	0.1
15	800	540	2.78	2379	2510	21	65	0.67	-0.66	1.87	4.7	0.1
15	800	560	2.72	2404	2534	21	62	0.64	-0.63	1.81	4.6	0.2
15	800	580	2.66	2427	2556	21	59	0.61	-0.61	1.76	4.5	0.2
15	800	600	2.61	2449	2576	20	56	0.59	-0.58	1.71	4.4	0.2
15	900	400	3.70	2348	2514	26	107	1.04	-1.02	2.49	6.3	0.2
15	900	420	3.60	2397	2561	25	100	0.97	-0.95	2.38	6.1	0.2
15	900	440	3.51	2444	2604	24	93	0.91	-0.89	2.27	5.9	0.2
15	900	460	3.41	2487	2645	24	88	0.85	-0.84	2.18	5.8	0.2
15	900	480	3.32	2527	2682	23	83	0.81	-0.79	2.09	5.6	0.2
15	900	500	3.24	2565	2718	23	78	0.76	-0.75	2.01	5.5	0.2
15	900	520	3.16	2600	2751	22	74	0.72	-0.71	1.94	5.3	0.2
15	900	540	3.09	2632	2781	22	70	0.69	-0.68	1.88	5.2	0.2
15	900	560	3.02	2661	2809	22	66	0.66	-0.65	1.82	5.1	0.2
15	900	580	2.96	2688	2835	21	63	0.63	-0.62	1.76	5.0	0.2
15	900	600	2.90	2713	2859	21	50	0.60	-0.60	1.72	4.9	0.2
15	1000	400	4.03	2553	2742	26	114	1.06	-1.04	2.49	6.8	0.2
15	1000	420	3.93	2603	2794	26	106	0.99	-0.97	2.38	6.6	0.2
15	1000	440	3.83	2662	2843	25	100	0.93	-0.91	2.27	6.5	0.2
15	1000	460	3.73	2711	2890	24	94	0.87	-0.86	2.18	6.3	0.2
15	1000	480	3.64	2757	2933	24	88	0.82	-0.81	2.09	6.1	0.2
15	1000	500	3.55	2800	2973	23	83	0.78	-0.77	2.02	6.0	0.2
15	1000	520	3.46	2840	3011	23	79	0.74	-0.73	1.94	5.9	0.2
15	1000	540	3.38	2877	3046	22	75	0.70	-0.69	1.88	5.7	0.2
15	1000	560	3.31	2911	3078	22	71	0.67	-0.66	1.82	5.6	0.2
15	1000	580	3.25	2942	3107	22	68	0.64	-0.63	1.77	5.5	0.2
15	1000	600	3.19	2971	3134	21	65	0.62	-0.61	1.72	5.4	0.3
15	1500	400	5.56	3486	3795	30	146	1.17	-1.14	2.48	9.4	0.4
15	1500	420	5.43	3575	3877	29	137	1.09	-1.07	2.37	9.2	0.4
15	1500	440	5.31	3659	3955	28	129	1.02	-1.00	2.27	9.0	0.4
15	1500	460	5.20	3739	4029	27	121	0.96	-0.94	2.18	8.8	0.4
15	1500	480	5.08	3814	4098	27	114	0.90	-0.89	2.10	8.6	0.4
15	1500	500	4.97	3885	4164	26	108	0.85	-0.84	2.02	8.4	0.4
15	1500	520	4.87	3951	4226	26	102	0.81	-0.79	1.95	8.2	0.4
15	1500	540	4.78	4012	4284	25	97	0.77	-0.76	1.89	8.1	0.4
15	1500	560	4.69	4068	4336	25	93	0.73	-0.72	1.83	7.9	0.4
15	1500	580	4.62	4119	4384	24	89	0.70	-0.69	1.78	7.8	0.5
15	1500	600	4.55	4166	4428	24	85	0.68	-0.67	1.74	7.7	0.5
15	2000	400	6.92	4303	4745	33	175	1.25	-1.22	2.46	11.7	0.6
15	2000	420	6.78	4423	4854	32	164	1.17	-1.14	2.36	11.5	0.6
15	2000	440	6.64	4538	4959	31	155	1.10	-1.07	2.26	11.2	0.6
15	2000	460	6.52	4647	5059	30	146	1.03	-1.01	2.18	11.0	0.6
15	2000	480	6.39	4750	5154	29	138	0.97	-0.95	2.09	10.8	0.6
15	2000	500	6.27	4849	5245	29	131	0.91	-0.90	2.02	10.6	0.6
15	2000	520	6.15	4941	5330	28	124	0.87	-0.85	1.95	10.4	0.6
15	2000	540	6.05	5025	5409	27	118	0.82	-0.81	1.89	10.2	0.6
15	2000	560	5.96	5103	5481	27	113	0.79	-0.77	1.84	10.1	0.6
15	2000	580	5.88	5173	5546	27	108	0.76	-0.74	1.79	9.9	0.7
15	2000	600	5.81	5237	5606	26	104	0.73	-0.72	1.75	9.8	0.8
15	2500	400	8.15	5037	5623	36	200	1.32	-1.29	2.45	13.8	0.7
15	2500	420	8.01	5187	5758	35	189	1.24	-1.21	2.35	13.5	0.7
15	2500	440	7.87	5330	5887	34	178	1.16	-1.13	2.26	13.3	0.8
15	2500	460	7.73	5467	6011	33	168	1.09	-1.06	2.17	13.1	0.8
15	2500	480	7.59	5597	6130	32	159	1.02	-1.00	2.09	12.8	0.8
15	2500	500	7.46	5722	6244	31	151	0.97	-0.95	2.02	12.6	0.8
15	2500	520	7.34	5833	6351	30	144	0.92	-0.90	1.95	12.4	0.8
15	2500	540	7.23	5946	6450	30	137	0.87	-0.86	1.89	12.2	0.8
15	2500	560	7.13	6044	6540	29	131	0.84	-0.82	1.84	12.1	0.9
15	2500	580	7.05	6131	6621	29	126	0.80	-0.79	1.80	11.9	1.0
15	2500	600	6.98	6212	6696	28	122	0.78	-0.76	1.76	11.8	1.1

Figure 6-65 (Sheet 7 of 20)

## Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	3000	400	9.30	5707	6447	38	223	1.39	-1.35	2.44	15.7	0.9
15	3000	420	9.15	5885	6605	37	211	1.29	-1.26	2.34	15.5	1.0
15	3000	440	9.00	6055	6757	36	199	1.21	-1.18	2.25	15.2	1.0
15	3000	460	8.85	6218	6904	35	189	1.14	-1.11	2.17	15.0	1.0
15	3000	480	8.71	6375	7046	34	179	1.07	-1.05	2.09	14.7	1.0
15	3000	500	8.57	6524	7181	33	170	1.02	-0.99	2.02	14.5	1.0
15	3000	520	8.45	6664	7308	32	162	0.96	-0.94	1.95	14.3	1.0
15	3000	540	8.33	6793	7426	32	155	0.92	-0.90	1.90	14.1	1.1
15	3000	560	8.24	6909	7533	31	149	0.88	-0.86	1.85	13.9	1.1
15	3000	580	8.15	7014	7628	31	143	0.85	-0.83	1.81	13.8	1.3
15	3000	600	8.08	7109	7716	30	138	0.82	-0.80	1.77	13.7	1.4
15	3500	400	10.37	6327	7231	40	245	1.44	-1.40	2.42	17.5	1.2
15	3500	420	10.21	6531	7410	39	231	1.34	-1.31	2.33	17.3	1.2
15	3500	440	10.06	6727	7583	38	219	1.26	-1.23	2.24	17.0	1.2
15	3500	460	9.91	6915	7751	37	208	1.19	-1.16	2.16	16.7	1.2
15	3500	480	9.76	7097	7913	36	197	1.12	-1.09	2.09	16.5	1.2
15	3500	500	9.62	7269	8068	35	188	1.06	-1.04	2.02	16.3	1.2
15	3500	520	9.49	7432	8215	34	179	1.00	-0.98	1.95	16.0	1.2
15	3500	540	9.38	7580	8349	33	172	0.96	-0.94	1.90	15.8	1.3
15	3500	560	9.28	7714	8471	33	165	0.92	-0.90	1.85	15.7	1.4
15	3500	580	9.20	7834	8580	32	159	0.88	-0.87	1.81	15.5	1.6
15	3500	600	9.13	7943	8680	32	154	0.86	-0.84	1.78	15.4	1.7
15	4000	400	11.38	6906	7981	42	264	1.48	-1.45	2.41	19.2	1.4
15	4000	420	11.22	7135	8180	41	250	1.39	-1.35	2.32	19.0	1.4
15	4000	440	11.07	7355	8373	40	237	1.30	-1.27	2.23	18.7	1.4
15	4000	460	10.91	7567	8560	38	225	1.23	-1.20	2.15	18.4	1.4
15	4000	480	10.76	7772	8741	38	214	1.16	-1.13	2.08	18.2	1.4
15	4000	500	10.62	7967	8914	37	204	1.10	-1.07	2.01	17.9	1.4
15	4000	520	10.49	8150	9079	36	195	1.04	-1.02	1.95	17.7	1.5
15	4000	540	10.37	8317	9229	35	187	0.99	-0.97	1.90	17.5	1.6
15	4000	560	10.28	8467	9365	34	180	0.95	-0.93	1.85	17.4	1.7
15	4000	580	10.19	8601	9486	34	174	0.92	-0.90	1.82	17.2	1.9
15	4000	600	10.13	8723	9597	34	169	0.89	-0.87	1.78	17.1	2.1
15	4500	400	12.35	7451	8705	44	283	1.53	-1.49	2.40	20.9	1.6
15	4500	420	12.18	7703	8922	42	268	1.43	-1.39	2.31	20.6	1.6
15	4500	440	12.02	7947	9132	41	254	1.34	-1.31	2.22	20.3	1.6
15	4500	460	11.87	8182	9338	40	242	1.27	-1.24	2.15	20.1	1.6
15	4500	480	11.71	8408	9537	39	230	1.19	-1.17	2.08	19.8	1.7
15	4500	500	11.57	8624	9727	38	220	1.13	-1.11	2.01	19.6	1.7
15	4500	520	11.43	8828	9909	37	210	1.07	-1.05	1.95	19.3	1.7
15	4500	540	11.32	9011	10072	37	202	1.03	-1.01	1.90	19.1	1.9
15	4500	560	11.23	9177	10221	36	195	0.99	-0.97	1.86	19.0	2.0
15	4500	580	11.15	9324	10353	36	189	0.95	-0.93	1.82	18.8	2.2
15	4500	600	11.08	9458	10474	35	183	0.92	-0.90	1.79	18.7	2.4
15	5000	400	13.26	7967	9406	45	300	1.56	-1.52	2.38	22.4	1.8
15	5000	420	13.10	8242	9640	44	284	1.47	-1.43	2.30	22.1	1.8
15	5000	440	12.94	8507	9868	43	270	1.38	-1.34	2.22	21.9	1.8
15	5000	460	12.78	8763	10090	42	258	1.30	-1.27	2.14	21.6	1.9
15	5000	480	12.62	9012	10306	41	246	1.23	-1.20	2.07	21.3	1.9
15	5000	500	12.48	9247	10512	40	235	1.16	-1.14	2.01	21.1	1.9
15	5000	520	12.34	9470	10709	39	225	1.11	-1.08	1.95	20.9	2.0
15	5000	540	12.23	9669	10885	38	216	1.06	-1.04	1.90	20.7	2.1
15	5000	560	12.14	9849	11045	38	209	1.02	-1.00	1.86	20.5	2.3
15	5000	580	12.06	10008	11187	37	202	0.98	-0.96	1.82	20.4	2.5
15	5000	600	12.00	10153	11317	37	196	0.95	-0.93	1.79	20.3	2.8
15	5500	400	14.15	8458	10089	47	316	1.60	-1.56	2.37	23.9	2.0
15	5500	420	13.98	8754	10338	45	300	1.50	-1.46	2.28	23.6	2.0
15	5500	440	13.81	9040	10582	44	286	1.41	-1.38	2.21	23.3	2.1
15	5500	460	13.65	9317	10820	43	272	1.33	-1.30	2.13	23.1	2.1
15	5500	480	13.50	9586	11052	42	260	1.26	-1.23	2.06	22.8	2.1
15	5500	500	13.35	9840	11273	41	249	1.19	-1.17	2.00	22.6	2.2
15	5500	520	13.22	10082	11484	40	238	1.13	-1.11	1.94	22.3	2.3
15	5500	540	13.11	10294	11671	40	230	1.09	-1.06	1.90	22.2	2.4
15	5500	560	13.02	10488	11842	39	222	1.05	-1.02	1.86	22.0	2.6
15	5500	580	12.95	10658	11993	38	215	1.01	-0.99	1.82	21.9	2.9
15	5500	600	12.89	10813	12132	38	209	0.98	-0.96	1.80	21.8	3.1

Figure 6-65 (Sheet 8 of 20)

# Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	1500	400	4.79	2930	3292	33	126	1.32	-1.29	2.46	8.1	0.3
20	1500	420	4.66	2990	3346	32	118	1.23	-1.21	2.35	7.9	0.3
20	1500	440	4.53	3047	3396	31	110	1.16	-1.14	2.26	7.7	0.3
20	1500	460	4.41	3099	3443	30	104	1.09	-1.07	2.17	7.5	0.3
20	1500	480	4.30	3148	3487	30	97	1.03	-1.01	2.08	7.3	0.3
20	1500	500	4.19	3193	3528	29	92	0.98	-0.96	2.00	7.1	0.3
20	1500	520	4.08	3235	3566	29	87	0.93	-0.91	1.93	6.9	0.3
20	1500	540	3.99	3274	3601	28	82	0.88	-0.87	1.87	6.7	0.3
20	1500	560	3.90	3309	3633	28	78	0.85	-0.84	1.81	6.6	0.3
20	1500	580	3.83	3341	3662	28	75	0.81	-0.80	1.77	6.5	0.3
20	1500	600	3.76	3370	3688	27	71	0.78	-0.78	1.72	6.3	0.4
20	2000	400	6.05	3671	4181	35	151	1.40	-1.37	2.45	10.2	0.5
20	2000	420	5.90	3756	4256	34	142	1.31	-1.28	2.34	10.0	0.4
20	2000	440	5.75	3836	4326	34	133	1.23	-1.21	2.25	9.7	0.4
20	2000	460	5.61	3911	4393	33	125	1.16	-1.14	2.16	9.5	0.4
20	2000	480	5.48	3982	4456	32	118	1.09	-1.07	2.08	9.3	0.4
20	2000	500	5.35	4047	4515	31	111	1.03	-1.02	2.00	9.0	0.4
20	2000	520	5.23	4109	4569	31	105	0.98	-0.97	1.94	8.8	0.4
20	2000	540	5.12	4164	4620	30	100	0.94	-0.92	1.87	8.7	0.5
20	2000	560	5.03	4215	4666	30	95	0.90	-0.89	1.82	8.5	0.5
20	2000	580	4.94	4261	4707	29	91	0.86	-0.85	1.77	8.3	0.5
20	2000	600	4.86	4303	4745	29	87	0.83	-0.82	1.73	8.2	0.6
20	2500	400	7.21	4346	5014	38	174	1.47	-1.44	2.43	12.2	0.6
20	2500	420	7.05	4456	5109	37	164	1.37	-1.35	2.33	11.9	0.6
20	2500	440	6.89	4559	5199	36	154	1.29	-1.26	2.24	11.6	0.6
20	2500	460	6.73	4656	5285	35	145	1.21	-1.19	2.15	11.4	0.6
20	2500	480	6.59	4748	5366	34	137	1.15	-1.13	2.07	11.1	0.6
20	2500	500	6.45	4834	5443	33	129	1.09	-1.07	2.00	10.9	0.6
20	2500	520	6.31	4915	5514	33	123	1.03	-1.01	1.93	10.7	0.6
20	2500	540	6.20	4988	5579	32	117	0.98	-0.97	1.88	10.5	0.6
20	2500	560	6.09	5054	5639	32	111	0.94	-0.93	1.83	10.3	0.7
20	2500	580	6.00	5114	5692	31	107	0.91	-0.89	1.78	10.1	0.8
20	2500	600	5.92	5168	5741	31	103	0.88	-0.86	1.74	10.0	0.8
20	3000	400	8.30	4969	5804	40	195	1.53	-1.49	2.42	14.0	0.8
20	3000	420	8.12	5102	5919	39	184	1.43	-1.40	2.32	13.7	0.8
20	3000	440	7.95	5228	6028	38	173	1.34	-1.32	2.23	13.4	0.8
20	3000	460	7.79	5347	6131	37	163	1.26	-1.24	2.15	13.2	0.8
20	3000	480	7.63	5461	6230	36	154	1.19	-1.17	2.07	12.9	0.8
20	3000	500	7.48	5567	6324	35	146	1.13	-1.11	2.00	12.6	0.8
20	3000	520	7.34	5666	6411	35	139	1.07	-1.06	1.93	12.4	0.8
20	3000	540	7.21	5756	6491	34	132	1.03	-1.01	1.88	12.2	0.8
20	3000	560	7.10	5838	6564	33	127	0.98	-0.97	1.83	12.0	0.9
20	3000	580	7.01	5911	6628	33	122	0.95	-0.93	1.79	11.8	1.0
20	3000	600	6.92	5977	6688	33	117	0.92	-0.90	1.75	11.7	1.1
20	3500	400	9.32	5550	6561	42	215	1.58	-1.54	2.40	15.8	1.0
20	3500	420	9.14	5705	6693	41	202	1.48	-1.45	2.31	15.4	1.0
20	3500	440	8.96	5853	6820	40	191	1.39	-1.36	2.22	15.1	1.0
20	3500	460	8.79	5994	6941	39	181	1.31	-1.28	2.14	14.8	1.0
20	3500	480	8.62	6128	7057	38	171	1.24	-1.21	2.06	14.6	1.0
20	3500	500	8.46	6254	7166	37	162	1.17	-1.15	1.99	14.3	1.0
20	3500	520	8.31	6372	7270	36	154	1.11	-1.10	1.93	14.0	1.0
20	3500	540	8.18	6477	7362	36	147	1.06	-1.05	1.88	13.8	1.1
20	3500	560	8.07	6574	7448	35	141	1.02	-1.01	1.83	13.6	1.1
20	3500	580	7.97	6659	7523	35	136	0.99	-0.97	1.79	13.5	1.3
20	3500	600	7.89	6738	7593	34	131	0.95	-0.94	1.76	13.3	1.4
20	4000	400	10.29	6095	7290	43	233	1.62	-1.59	2.39	17.4	1.2
20	4000	420	10.10	6272	7439	42	220	1.52	-1.49	2.29	17.1	1.2
20	4000	440	9.92	6441	7582	41	208	1.43	-1.40	2.21	16.8	1.2
20	4000	460	9.74	6603	7720	40	197	1.35	-1.32	2.13	16.5	1.2
20	4000	480	9.56	6757	7852	39	186	1.28	-1.25	2.06	16.2	1.2
20	4000	500	9.40	6901	7977	39	177	1.21	-1.19	1.99	15.9	1.2
20	4000	520	9.24	7038	8095	38	169	1.15	-1.13	1.93	15.6	1.2
20	4000	540	9.11	7158	8200	37	161	1.10	-1.08	1.88	15.4	1.3
20	4000	560	9.00	7269	8297	37	155	1.06	-1.04	1.83	15.2	1.4
20	4000	580	8.90	7367	8383	36	149	1.02	-1.00	1.79	15.0	1.5
20	4000	600	8.82	7456	8461	36	144	0.99	-0.97	1.76	14.9	1.7

Figure 6-65 (Sheet 9 of 20)

# Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	4500	400	11.22	6610	7936	45	250	1.66	-1.62	2.37	19.0	1.4
20	4500	420	11.02	6803	8161	44	236	1.56	-1.53	2.28	18.6	1.4
20	4500	440	10.83	6999	8320	43	223	1.47	-1.44	2.20	18.3	1.4
20	4500	460	10.65	7173	8473	42	212	1.39	-1.36	2.12	18.0	1.4
20	4500	480	10.47	7353	8621	41	201	1.31	-1.28	2.05	17.7	1.4
20	4500	500	10.30	7516	8760	40	191	1.24	-1.22	1.99	17.4	1.4
20	4500	520	10.14	7669	8892	39	182	1.18	-1.16	1.93	17.1	1.4
20	4500	540	10.01	7804	9009	39	175	1.13	-1.11	1.88	16.9	1.5
20	4500	560	9.89	7929	9117	38	169	1.09	-1.07	1.83	16.7	1.7
20	4500	580	9.80	8037	9211	37	162	1.05	-1.03	1.80	16.6	1.8
20	4500	600	9.71	8137	9299	37	157	1.02	-1.00	1.77	16.4	2.0
20	5000	400	12.11	7093	8683	47	266	1.70	-1.66	2.36	20.5	1.6
20	5000	420	11.91	7313	8863	45	251	1.60	-1.56	2.27	20.1	1.6
20	5000	440	11.71	7527	9037	44	238	1.50	-1.47	2.19	19.8	1.6
20	5000	460	11.52	7728	9204	43	226	1.42	-1.39	2.12	19.5	1.6
20	5000	480	11.34	7920	9366	42	215	1.34	-1.32	2.05	19.2	1.6
20	5000	500	11.17	8100	9519	41	205	1.27	-1.25	1.98	18.9	1.6
20	5000	520	11.00	8271	9665	41	195	1.21	-1.19	1.92	18.6	1.7
20	5000	540	10.85	8419	9792	40	183	1.16	-1.14	1.88	18.4	1.8
20	5000	560	10.76	8556	9910	39	181	1.12	-1.10	1.83	18.2	1.9
20	5000	580	10.66	8676	10014	39	174	1.08	-1.06	1.80	18.0	2.1
20	5000	600	10.58	8786	10109	38	169	1.05	-1.03	1.77	17.9	2.3
20	5500	400	12.96	7566	9354	48	281	1.73	-1.69	2.34	21.9	1.8
20	5500	420	12.76	7804	9547	47	266	1.63	-1.59	2.26	21.6	1.8
20	5500	440	12.56	8033	9735	46	252	1.53	-1.50	2.18	21.2	1.8
20	5500	460	12.36	8252	9917	45	240	1.45	-1.42	2.11	20.9	1.8
20	5500	480	12.18	8462	10093	44	228	1.37	-1.34	2.04	20.6	1.8
20	5500	500	12.00	8659	10258	43	219	1.30	-1.28	1.98	20.3	1.9
20	5500	520	11.84	8846	10417	42	208	1.24	-1.22	1.92	20.0	1.9
20	5500	540	11.71	9007	10553	41	200	1.19	-1.17	1.88	19.8	2.0
20	5500	560	11.60	9156	10681	41	193	1.15	-1.13	1.84	19.6	2.2
20	5500	580	11.50	9286	10792	40	186	1.11	-1.09	1.80	19.4	2.4
20	5500	600	11.42	9405	10895	40	181	1.08	-1.06	1.77	19.3	2.6
20	6000	400	13.78	8012	10010	49	295	1.76	-1.72	2.33	23.3	2.0
20	6000	420	13.58	8270	10217	48	279	1.66	-1.62	2.25	22.9	2.0
20	6000	440	13.38	8517	10418	47	266	1.56	-1.53	2.17	22.6	2.0
20	6000	460	13.19	8754	10613	46	253	1.48	-1.45	2.10	22.3	2.0
20	6000	480	12.99	8982	10802	45	241	1.40	-1.37	2.03	22.0	2.0
20	6000	500	12.81	9195	10980	44	230	1.33	-1.30	1.97	21.7	2.1
20	6000	520	12.65	9397	11150	43	220	1.27	-1.24	1.92	21.4	2.1
20	6000	540	12.53	9570	11295	42	212	1.22	-1.20	1.87	21.2	2.3
20	6000	560	12.41	9731	11432	42	204	1.17	-1.15	1.84	21.0	2.5
20	6000	580	12.32	9870	11550	41	198	1.14	-1.12	1.80	20.8	2.7
20	6000	600	12.24	9993	11660	41	192	1.10	-1.08	1.77	20.7	3.0
20	6500	400	14.58	8441	10654	50	308	1.79	-1.75	2.31	24.6	2.2
20	6500	420	14.37	8717	10874	49	293	1.68	-1.64	2.23	24.3	2.2
20	6500	440	14.17	8982	11087	48	278	1.59	-1.55	2.16	23.9	2.2
20	6500	460	13.97	9237	11295	47	265	1.50	-1.47	2.09	23.6	2.2
20	6500	480	13.78	9482	11496	46	253	1.42	-1.39	2.03	23.3	2.3
20	6500	500	13.60	9711	11685	45	242	1.35	-1.33	1.97	23.0	2.3
20	6500	520	13.44	9926	11865	44	231	1.29	-1.27	1.91	22.7	2.4
20	6500	540	13.32	10111	12020	44	223	1.24	-1.22	1.87	22.5	2.6
20	6500	560	13.21	10282	12164	43	215	1.20	-1.18	1.83	22.3	2.8
20	6500	580	13.12	10430	12290	42	209	1.16	-1.14	1.80	22.2	3.0
20	6500	600	13.04	10567	12406	42	203	1.13	-1.11	1.78	22.0	3.3
20	7000	400	15.36	8355	11287	51	321	1.91	-1.77	2.30	26.0	2.4
20	7000	420	15.14	8643	11519	50	305	1.71	-1.67	2.22	25.6	2.4
20	7000	440	14.94	8930	11744	49	290	1.61	-1.58	2.15	25.2	2.4
20	7000	460	14.74	9202	11964	48	277	1.52	-1.49	2.08	24.9	2.5
20	7000	480	14.54	9463	12176	47	264	1.45	-1.42	2.02	24.6	2.5
20	7000	500	14.37	9707	12377	46	253	1.38	-1.35	1.96	24.3	2.6
20	7000	520	14.21	9945	12566	45	242	1.31	-1.29	1.91	24.0	2.7
20	7000	540	14.09	10162	12729	45	234	1.27	-1.24	1.87	23.8	2.9
20	7000	560	13.98	10363	12881	44	226	1.22	-1.20	1.83	23.6	3.1
20	7000	580	13.89	10570	13013	44	220	1.18	-1.16	1.80	23.5	3.4
20	7000	600	13.82	11114	13135	43	214	1.15	-1.13	1.78	23.4	3.6

Figure 6-65 (Sheet 10 of 20)

**Ballistic Table — BDU-33 Low Drag Bomb**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	7500	400	16.11	9253	11911	52	333	1.33	-1.79	2.29	27.2	2.6
20	7500	420	15.89	9564	12154	51	317	1.73	-1.69	2.21	26.9	2.6
20	7500	440	15.68	9863	12391	50	302	1.63	-1.60	2.14	26.5	2.7
20	7500	460	15.48	10152	12622	49	289	1.55	-1.51	2.07	26.2	2.7
20	7500	480	15.29	10428	12845	48	275	1.47	-1.44	2.01	25.8	2.7
20	7500	500	15.12	10687	13056	47	264	1.40	-1.37	1.96	25.5	2.8
20	7500	520	14.96	10926	13253	46	253	1.34	-1.31	1.91	25.3	2.9
20	7500	540	14.85	11134	13424	46	244	1.29	-1.26	1.87	25.1	3.1
20	7500	560	14.74	11325	13583	45	236	1.24	-1.22	1.83	24.9	3.4
20	7500	580	14.65	11489	13721	45	230	1.21	-1.18	1.80	24.8	3.7
20	7500	600	14.58	11642	13848	44	224	1.17	-1.15	1.78	24.6	4.0
20	8000	400	16.84	9639	12527	53	344	1.85	-1.81	2.27	28.5	2.8
20	8000	420	16.62	9966	12730	52	328	1.75	-1.71	2.20	28.1	2.8
20	8000	440	16.41	10282	13028	51	313	1.65	-1.62	2.13	27.7	2.9
20	8000	460	16.21	10586	13269	50	299	1.57	-1.53	2.06	27.4	2.9
20	8000	480	16.02	10878	13503	49	286	1.49	-1.46	2.00	27.1	3.0
20	8000	500	15.85	11150	13723	48	274	1.42	-1.39	1.95	26.8	3.0
20	8000	520	15.70	11401	13927	47	263	1.36	-1.33	1.91	26.5	3.2
20	8000	540	15.58	11619	14107	47	255	1.31	-1.28	1.87	26.3	3.4
20	8000	560	15.48	11819	14272	46	247	1.26	-1.24	1.83	26.2	3.7
20	8000	580	15.40	11991	14415	46	240	1.23	-1.20	1.81	26.0	4.0
20	8000	600	15.33	12151	14548	45	234	1.19	-1.17	1.78	25.9	4.4
20	8500	400	17.55	10013	13135	54	356	1.87	-1.83	2.26	29.7	3.0
20	8500	420	17.33	10357	13393	53	339	1.77	-1.73	2.19	29.3	3.1
20	8500	440	17.12	10683	13656	52	323	1.67	-1.64	2.12	28.9	3.1
20	8500	460	16.92	11003	13908	51	309	1.59	-1.55	2.06	28.6	3.1
20	8500	480	16.73	11314	14151	50	296	1.51	-1.48	2.00	28.3	3.2
20	8500	500	16.56	11600	14391	49	284	1.44	-1.41	1.95	28.0	3.3
20	8500	520	16.42	11860	14591	48	273	1.38	-1.35	1.90	27.8	3.5
20	8500	540	16.31	12089	14779	48	264	1.33	-1.30	1.86	27.6	3.7
20	8500	560	16.20	12293	14949	47	256	1.28	-1.26	1.83	27.4	4.0
20	8500	580	16.13	12476	15097	47	250	1.25	-1.22	1.81	27.3	4.4
20	8500	600	16.06	12643	15235	46	243	1.21	-1.19	1.78	27.1	4.7
20	9000	400	18.25	10377	13736	55	365	1.89	-1.85	2.24	30.8	3.2
20	9000	420	18.03	10736	14009	54	349	1.78	-1.74	2.17	30.5	3.3
20	9000	440	17.82	11083	14277	53	334	1.69	-1.65	2.11	30.1	3.3
20	9000	460	17.62	11417	14538	52	319	1.60	-1.57	2.05	29.8	3.4
20	9000	480	17.43	11737	14790	51	306	1.52	-1.49	1.99	29.5	3.4
20	9000	500	17.26	12036	15029	50	294	1.46	-1.43	1.94	29.2	3.6
20	9000	520	17.13	12305	15245	49	283	1.39	-1.37	1.90	28.9	3.8
20	9000	540	17.01	12545	15440	48	274	1.35	-1.32	1.86	28.8	4.0
20	9000	560	16.91	12761	15615	48	266	1.30	-1.28	1.83	28.6	4.3
20	9000	580	16.84	12946	15767	47	259	1.27	-1.24	1.80	28.5	4.7
20	9000	600	16.78	13119	15910	47	253	1.23	-1.21	1.78	28.4	5.1
20	9500	400	18.93	10730	14331	56	376	1.90	-1.86	2.23	32.0	3.4
20	9500	420	18.71	11104	14614	55	359	1.80	-1.76	2.16	31.6	3.5
20	9500	440	18.50	11466	14891	53	343	1.70	-1.67	2.10	31.3	3.5
20	9500	460	18.30	11815	15161	52	329	1.62	-1.59	2.04	30.9	3.6
20	9500	480	18.11	12143	15422	52	315	1.54	-1.51	1.98	30.6	3.7
20	9500	500	17.95	12459	15668	51	303	1.47	-1.44	1.94	30.3	3.8
20	9500	520	17.82	12737	15890	50	292	1.41	-1.39	1.90	30.1	4.0
20	9500	540	17.71	12983	16091	49	283	1.36	-1.34	1.86	29.9	4.3
20	9500	560	17.61	13210	16271	49	275	1.32	-1.29	1.83	29.8	4.7
20	9500	580	17.54	13401	16427	48	268	1.28	-1.26	1.80	29.6	5.1
20	9500	600	17.48	13581	16574	48	262	1.25	-1.23	1.78	29.5	5.5
20	10000	400	19.59	11074	14921	56	386	1.92	-1.88	2.22	33.1	3.6
20	10000	420	19.38	11463	15212	55	369	1.81	-1.78	2.15	32.7	3.7
20	10000	440	19.17	11840	15498	54	353	1.72	-1.68	2.09	32.4	3.8
20	10000	460	18.97	12203	15777	53	338	1.63	-1.60	2.03	32.1	3.8
20	10000	480	18.79	12548	16045	52	324	1.56	-1.53	1.98	31.7	3.9
20	10000	500	18.63	12871	16299	51	312	1.49	-1.46	1.93	31.5	4.1
20	10000	520	18.50	13153	16526	51	301	1.43	-1.40	1.89	31.3	4.3
20	10000	540	18.39	13418	16734	50	292	1.38	-1.35	1.86	31.1	4.6
20	10000	560	18.30	13646	16918	50	284	1.34	-1.31	1.83	30.9	5.0
20	10000	580	18.24	13843	17077	49	277	1.30	-1.28	1.80	30.8	5.4
20	10000	600	18.18	14030	17229	49	271	1.27	-1.25	1.78	30.7	5.8

**Figure 6-65 (Sheet 11 of 20)**

## Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	1500	400	3.74	2102	2598	39	97	1.60	-1.38	2.44	6.3	0.2
30	1500	420	3.61	2132	2612	39	90	1.51	-1.49	2.33	6.1	0.2
30	1500	440	3.49	2166	2635	38	84	1.42	-1.41	2.24	5.9	0.2
30	1500	460	3.37	2191	2655	38	79	1.35	-1.33	2.15	5.7	0.2
30	1500	480	3.27	2213	2674	37	74	1.28	-1.27	2.06	5.5	0.2
30	1500	500	3.17	2234	2691	37	70	1.22	-1.21	1.99	5.4	0.2
30	1500	520	3.07	2253	2707	36	66	1.16	-1.15	1.92	5.2	0.2
30	1500	540	2.99	2271	2721	36	62	1.11	-1.10	1.85	5.0	0.2
30	1500	560	2.91	2286	2734	36	59	1.07	-1.06	1.80	4.9	0.2
30	1500	580	2.84	2300	2746	35	56	1.03	-1.02	1.75	4.8	0.2
30	1500	600	2.77	2313	2757	35	54	0.99	-0.99	1.70	4.7	0.2
30	2000	400	4.81	2696	3357	41	117	1.67	-1.65	2.42	8.1	0.3
30	2000	420	4.66	2741	3393	41	109	1.57	-1.55	2.32	7.9	0.3
30	2000	440	4.51	2782	3426	40	102	1.48	-1.46	2.22	7.6	0.3
30	2000	460	4.37	2819	3457	39	95	1.40	-1.39	2.14	7.4	0.3
30	2000	480	4.24	2854	3485	39	89	1.33	-1.32	2.06	7.2	0.3
30	2000	500	4.12	2886	3511	38	84	1.26	-1.25	1.98	7.0	0.3
30	2000	520	4.00	2915	3535	38	79	1.21	-1.19	1.91	6.8	0.3
30	2000	540	3.90	2941	3557	37	75	1.16	-1.14	1.85	6.6	0.3
30	2000	560	3.81	2965	3577	37	71	1.11	-1.10	1.80	6.4	0.3
30	2000	580	3.72	2987	3594	37	68	1.07	-1.06	1.75	6.3	0.3
30	2000	600	3.65	3006	3611	36	65	1.04	-1.03	1.71	6.2	0.4
30	2500	400	5.82	3244	4036	43	135	1.73	-1.70	2.40	9.3	0.5
30	2500	420	5.65	3304	4143	42	126	1.63	-1.60	2.30	9.5	0.5
30	2500	440	5.48	3360	4198	42	118	1.53	-1.51	2.21	9.3	0.4
30	2500	460	5.33	3411	4229	41	110	1.45	-1.43	2.13	9.0	0.4
30	2500	480	5.18	3458	4267	40	104	1.37	-1.36	2.05	8.7	0.4
30	2500	500	5.03	3502	4303	40	98	1.31	-1.29	1.98	8.5	0.4
30	2500	520	4.90	3542	4336	39	92	1.25	-1.23	1.91	8.3	0.4
30	2500	540	4.79	3578	4365	39	88	1.19	-1.18	1.85	8.1	0.4
30	2500	560	4.68	3611	4392	38	83	1.15	-1.14	1.80	7.9	0.5
30	2500	580	4.59	3640	4416	38	80	1.11	-1.10	1.75	7.8	0.5
30	2500	600	4.50	3667	4438	38	76	1.07	-1.06	1.71	7.6	0.5
30	3000	400	6.79	3753	4810	45	151	1.78	-1.75	2.38	11.5	0.6
30	3000	420	6.60	3835	4869	44	142	1.67	-1.65	2.29	11.1	0.6
30	3000	440	6.41	3905	4924	43	133	1.58	-1.56	2.20	10.8	0.6
30	3000	460	6.24	3970	4976	43	125	1.49	-1.47	2.12	10.5	0.6
30	3000	480	6.07	4031	5025	42	117	1.42	-1.40	2.04	10.3	0.6
30	3000	500	5.92	4087	5070	41	111	1.35	-1.33	1.97	10.0	0.6
30	3000	520	5.77	4139	5112	41	105	1.28	-1.27	1.91	9.7	0.6
30	3000	540	5.64	4185	5149	40	100	1.23	-1.22	1.85	9.5	0.6
30	3000	560	5.52	4227	5183	40	95	1.18	-1.17	1.80	9.3	0.6
30	3000	580	5.42	4264	5214	39	91	1.14	-1.13	1.76	9.2	0.7
30	3000	600	5.33	4298	5242	39	87	1.11	-1.10	1.72	9.0	0.7
30	3500	400	7.71	4246	5502	47	167	1.82	-1.79	2.37	13.0	0.8
30	3500	420	7.50	4337	5573	46	157	1.72	-1.69	2.27	12.7	0.8
30	3500	440	7.30	4423	5640	45	147	1.62	-1.60	2.19	12.3	0.7
30	3500	460	7.11	4502	5703	44	138	1.53	-1.51	2.11	12.0	0.7
30	3500	480	6.93	4576	5761	43	130	1.45	-1.43	2.03	11.7	0.7
30	3500	500	6.77	4645	5816	43	123	1.38	-1.36	1.97	11.4	0.7
30	3500	520	6.61	4709	5867	42	117	1.32	-1.30	1.90	11.2	0.7
30	3500	540	6.47	4765	5912	41	111	1.26	-1.25	1.85	10.9	0.8
30	3500	560	6.35	4816	5954	41	106	1.22	-1.20	1.80	10.7	0.8
30	3500	580	6.24	4861	5990	41	101	1.18	-1.16	1.76	10.5	0.9
30	3500	600	6.14	4903	6024	40	97	1.14	-1.13	1.72	10.4	0.9
30	4000	400	8.59	4703	6178	48	182	1.86	-1.83	2.35	14.5	0.9
30	4000	420	8.37	4815	6260	47	171	1.75	-1.73	2.26	14.1	0.9
30	4000	440	8.16	4915	6337	46	161	1.66	-1.63	2.18	13.8	0.9
30	4000	460	7.96	5009	6410	45	151	1.57	-1.54	2.10	13.5	0.9
30	4000	480	7.77	5097	6479	45	143	1.49	-1.47	2.03	13.1	0.9
30	4000	500	7.59	5179	6544	44	135	1.41	-1.40	1.96	12.8	0.9
30	4000	520	7.42	5254	6603	43	129	1.35	-1.33	1.90	12.5	0.9
30	4000	540	7.28	5320	6656	43	122	1.30	-1.28	1.85	12.3	0.9
30	4000	560	7.15	5381	6705	42	117	1.25	-1.23	1.80	12.1	1.0
30	4000	580	7.04	5434	6747	42	112	1.21	-1.19	1.76	11.9	1.1
30	4000	600	6.94	5483	6787	41	108	1.17	-1.16	1.73	11.7	1.2

Figure 6-65 (Sheet 12 of 20)



**Ballistic Table — BDU-33 Low Drag Bomb**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	4500	400	9.44	5149	6838	49	196	1.90	-1.87	2.33	16.0	1.1
30	4500	420	9.21	5271	6931	48	184	1.79	-1.76	2.25	15.6	1.1
30	4500	440	8.99	5387	7019	47	173	1.69	-1.66	2.16	15.2	1.1
30	4500	460	8.78	5495	7102	47	164	1.60	-1.58	2.09	14.8	1.0
30	4500	480	8.58	5597	7181	46	155	1.52	-1.50	2.02	14.5	1.0
30	4500	500	8.39	5690	7255	45	146	1.44	-1.43	1.95	14.2	1.0
30	4500	520	8.21	5773	7323	44	139	1.38	-1.36	1.90	13.9	1.1
30	4500	540	8.07	5854	7383	44	133	1.33	-1.31	1.85	13.6	1.1
30	4500	560	7.93	5924	7439	43	127	1.28	-1.26	1.80	13.4	1.2
30	4500	580	7.82	5984	7488	43	122	1.24	-1.22	1.76	13.2	1.3
30	4500	600	7.72	6041	7533	42	117	1.20	-1.19	1.73	13.0	1.4
30	5000	400	10.26	5570	7485	51	209	1.93	-1.90	2.32	17.3	1.3
30	5000	420	10.02	5709	7589	50	197	1.82	-1.79	2.23	16.9	1.2
30	5000	440	9.79	5839	7687	49	186	1.72	-1.69	2.15	16.5	1.2
30	5000	460	9.57	5961	7780	48	175	1.63	-1.60	2.08	16.2	1.2
30	5000	480	9.36	6076	7869	47	166	1.55	-1.52	2.01	15.8	1.2
30	5000	500	9.16	6183	7951	46	157	1.47	-1.45	1.95	15.5	1.2
30	5000	520	8.99	6281	8028	45	150	1.41	-1.39	1.89	15.2	1.2
30	5000	540	8.84	6367	8096	45	143	1.35	-1.33	1.84	14.9	1.3
30	5000	560	8.70	6446	8158	44	137	1.30	-1.29	1.80	14.7	1.4
30	5000	580	8.58	6514	8212	44	132	1.26	-1.25	1.77	14.5	1.5
30	5000	600	8.48	6573	8263	44	127	1.23	-1.21	1.73	14.3	1.7
30	5500	400	11.05	5975	8121	52	221	1.96	-1.93	2.30	18.7	1.4
30	5500	420	10.81	6128	8235	51	209	1.85	-1.82	2.22	18.3	1.4
30	5500	440	10.57	6273	8343	50	197	1.75	-1.72	2.14	17.9	1.4
30	5500	460	10.34	6410	8446	49	186	1.66	-1.63	2.07	17.5	1.4
30	5500	480	10.12	6539	8544	48	177	1.57	-1.55	2.00	17.1	1.4
30	5500	500	9.92	6657	8635	47	168	1.50	-1.48	1.94	16.8	1.4
30	5500	520	9.74	6765	8720	46	160	1.43	-1.41	1.89	16.5	1.4
30	5500	540	9.59	6862	8794	46	153	1.33	-1.36	1.84	16.2	1.5
30	5500	560	9.44	6950	8863	45	147	1.33	-1.31	1.80	16.0	1.6
30	5500	580	9.33	7026	8922	45	141	1.29	-1.27	1.77	15.8	1.8
30	5500	600	9.23	7097	8978	45	136	1.25	-1.24	1.74	15.6	1.9
30	6000	400	11.82	6365	8747	53	233	1.99	-1.95	2.28	20.0	1.6
30	6000	420	11.57	6533	8870	52	220	1.87	-1.84	2.20	19.6	1.6
30	6000	440	11.33	6692	8988	51	208	1.77	-1.74	2.13	19.1	1.6
30	6000	460	11.09	6842	9100	50	197	1.68	-1.65	2.06	18.7	1.6
30	6000	480	10.87	6984	9207	49	187	1.60	-1.57	1.99	18.4	1.6
30	6000	500	10.66	7115	9307	48	178	1.52	-1.50	1.94	18.0	1.6
30	6000	520	10.48	7235	9399	47	170	1.46	-1.44	1.88	17.7	1.6
30	6000	540	10.32	7340	9480	47	162	1.40	-1.38	1.84	17.4	1.7
30	6000	560	10.18	7436	9555	46	156	1.35	-1.33	1.80	17.2	1.9
30	6000	580	10.07	7519	9620	46	151	1.31	-1.30	1.77	17.0	2.0
30	6000	600	9.96	7597	9681	46	146	1.28	-1.26	1.74	16.8	2.2
30	6500	400	12.57	6741	9364	54	245	2.01	-1.98	2.27	21.2	1.8
30	6500	420	12.31	6924	9497	53	231	1.90	-1.87	2.19	20.8	1.8
30	6500	440	12.06	7097	9624	52	219	1.80	-1.77	2.12	20.4	1.8
30	6500	460	11.82	7261	9745	51	207	1.70	-1.68	2.05	20.0	1.8
30	6500	480	11.59	7415	9860	50	197	1.62	-1.60	1.99	19.6	1.8
30	6500	500	11.38	7558	9968	49	187	1.54	-1.52	1.93	19.2	1.8
30	6500	520	11.20	7687	10067	48	179	1.48	-1.46	1.88	18.9	1.9
30	6500	540	11.04	7803	10156	48	172	1.43	-1.41	1.84	18.7	2.0
30	6500	560	10.90	7907	10235	47	165	1.38	-1.36	1.80	18.4	2.1
30	6500	580	10.79	7997	10305	47	160	1.34	-1.32	1.77	18.2	2.3
30	6500	600	10.68	8082	10371	46	154	1.30	-1.28	1.74	18.0	2.5
30	7000	400	13.30	7104	9974	55	255	2.03	-2.00	2.25	22.5	2.0
30	7000	420	13.04	7301	10115	54	242	1.92	-1.89	2.18	22.0	2.0
30	7000	440	12.78	7488	10251	53	229	1.82	-1.79	2.11	21.6	1.9
30	7000	460	12.53	7665	10381	52	217	1.72	-1.70	2.04	21.2	1.9
30	7000	480	12.30	7832	10504	51	206	1.64	-1.62	1.99	20.8	1.9
30	7000	500	12.09	7987	10620	50	197	1.57	-1.54	1.92	20.4	2.0
30	7000	520	11.91	8126	10725	49	188	1.50	-1.48	1.88	20.1	2.1
30	7000	540	11.75	8251	10820	49	181	1.45	-1.43	1.83	19.9	2.2
30	7000	560	11.61	8362	10905	48	174	1.40	-1.38	1.80	19.6	2.4
30	7000	580	11.49	8459	10980	48	168	1.36	-1.34	1.77	19.4	2.6
30	7000	600	11.39	8550	11050	47	163	1.32	-1.30	1.74	19.2	2.8

**Figure 6-65 (Sheet 13 of 20)**

## Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	7500	400	14.01	7456	10576	56	266	2.05	-2.02	2.24	23.7	2.2
30	7500	420	13.74	7667	10726	54	252	1.94	-1.91	2.17	23.2	2.1
30	7500	440	13.48	7868	10870	53	239	1.84	-1.81	2.10	22.8	2.1
30	7500	460	13.23	8058	11008	53	227	1.74	-1.72	2.03	22.4	2.1
30	7500	480	13.00	8237	11140	52	216	1.66	-1.64	1.97	22.0	2.1
30	7500	500	12.78	8403	11263	51	206	1.59	-1.56	1.92	21.6	2.2
30	7500	520	12.60	8552	11375	50	197	1.52	-1.50	1.87	21.3	2.3
30	7500	540	12.44	8686	11476	50	189	1.47	-1.45	1.83	21.0	2.4
30	7500	560	12.30	8803	11565	49	183	1.42	-1.40	1.80	20.8	2.6
30	7500	580	12.19	8907	11644	49	177	1.38	-1.36	1.77	20.6	2.9
30	7500	600	12.09	9005	11719	48	171	1.34	-1.33	1.74	20.4	3.1
30	8000	400	14.71	7798	11172	56	275	2.07	-2.03	2.22	24.9	2.3
30	8000	420	14.43	8023	11330	55	261	1.96	-1.92	2.15	24.4	2.3
30	8000	440	14.17	8237	11482	54	248	1.86	-1.83	2.09	23.9	2.3
30	8000	460	13.92	8440	11629	53	236	1.76	-1.73	2.02	23.5	2.3
30	8000	480	13.68	8630	11768	52	225	1.68	-1.65	1.96	23.1	2.4
30	8000	500	13.47	8807	11898	52	214	1.60	-1.58	1.91	22.8	2.4
30	8000	520	13.28	8965	12015	51	206	1.54	-1.52	1.87	22.5	2.5
30	8000	540	13.12	9108	12122	50	198	1.49	-1.47	1.83	22.2	2.7
30	8000	560	12.99	9232	12216	50	191	1.44	-1.42	1.80	22.0	2.9
30	8000	580	12.88	9342	12300	50	185	1.40	-1.38	1.77	21.8	3.2
30	8000	600	12.77	9446	12379	49	180	1.36	-1.34	1.74	21.6	3.4
30	8500	400	15.39	8130	11762	57	285	2.09	-2.05	2.21	26.0	2.5
30	8500	420	15.11	8368	11928	56	270	1.97	-1.94	2.14	25.5	2.5
30	8500	440	14.84	8595	12088	55	257	1.87	-1.84	2.07	25.1	2.5
30	8500	460	14.59	8811	12242	54	245	1.78	-1.75	2.01	24.7	2.5
30	8500	480	14.35	9013	12389	53	233	1.70	-1.67	1.96	24.3	2.6
30	8500	500	14.14	9200	12526	52	223	1.62	-1.60	1.91	23.9	2.6
30	8500	520	13.96	9366	12648	52	214	1.56	-1.54	1.86	23.6	2.8
30	8500	540	13.79	9518	12761	51	206	1.50	-1.48	1.83	23.3	3.0
30	8500	560	13.66	9648	12858	51	199	1.46	-1.44	1.80	23.1	3.2
30	8500	580	13.55	9765	12946	50	193	1.42	-1.40	1.77	22.9	3.5
30	8500	600	13.45	9875	13030	50	188	1.38	-1.36	1.74	22.7	3.7
30	9000	400	16.05	8453	12347	58	294	2.10	-2.07	2.20	27.1	2.7
30	9000	420	15.77	8705	12521	57	279	1.99	-1.96	2.13	26.7	2.7
30	9000	440	15.50	8944	12688	56	266	1.89	-1.86	2.06	26.2	2.7
30	9000	460	15.24	9172	12850	55	253	1.80	-1.77	2.00	25.8	2.7
30	9000	480	15.01	9385	13003	54	242	1.71	-1.69	1.95	25.4	2.8
30	9000	500	14.80	9582	13146	53	231	1.64	-1.61	1.90	25.0	2.9
30	9000	520	14.62	9757	13274	53	222	1.58	-1.55	1.86	24.7	3.0
30	9000	540	14.45	9918	13392	52	214	1.52	-1.50	1.82	24.4	3.2
30	9000	560	14.33	10052	13493	52	207	1.48	-1.46	1.79	24.2	3.5
30	9000	580	14.22	10176	13585	51	201	1.44	-1.42	1.77	24.0	3.8
30	9000	600	14.12	10292	13672	51	195	1.40	-1.38	1.74	23.9	4.0
30	9500	400	16.70	8768	12928	59	303	2.12	-2.08	2.18	28.2	2.9
30	9500	420	16.42	9032	13108	57	288	2.00	-1.97	2.12	27.7	2.9
30	9500	440	16.15	9284	13283	57	274	1.90	-1.87	2.05	27.3	2.9
30	9500	460	15.89	9524	13452	56	261	1.81	-1.78	2.00	26.9	2.9
30	9500	480	15.66	9749	13611	55	250	1.73	-1.70	1.94	26.5	3.0
30	9500	500	15.45	9955	13760	54	239	1.66	-1.63	1.90	26.1	3.1
30	9500	520	15.27	10138	13893	53	230	1.59	-1.57	1.86	25.8	3.3
30	9500	540	15.11	10306	14017	53	222	1.54	-1.52	1.82	25.5	3.5
30	9500	560	14.99	10446	14120	52	215	1.49	-1.47	1.79	25.3	3.8
30	9500	580	14.88	10576	14216	52	209	1.45	-1.43	1.77	25.1	4.1
30	9500	600	14.77	10698	14307	52	203	1.42	-1.40	1.75	25.0	4.4
30	10000	400	17.34	9075	13504	59	311	2.13	-2.09	2.17	29.3	3.1
30	10000	420	17.06	9352	13692	58	296	2.02	-1.99	2.11	28.8	3.1
30	10000	440	16.78	9616	13873	57	282	1.92	-1.89	2.04	28.4	3.1
30	10000	460	16.53	9867	14048	56	269	1.83	-1.80	1.99	27.9	3.2
30	10000	480	16.29	10101	14214	55	257	1.74	-1.72	1.94	27.5	3.2
30	10000	500	16.09	10318	14368	55	247	1.67	-1.65	1.89	27.2	3.4
30	10000	520	15.91	10509	14506	54	238	1.61	-1.59	1.85	26.9	3.5
30	10000	540	15.75	10684	14634	54	229	1.55	-1.53	1.82	26.6	3.8
30	10000	560	15.64	10830	14740	53	223	1.51	-1.49	1.79	26.4	4.1
30	10000	580	15.53	10965	14840	53	216	1.47	-1.45	1.77	26.2	4.4
30	10000	600	15.43	11093	14935	52	211	1.44	-1.42	1.75	26.1	4.7

**Figure 6-65 (Sheet 14 of 20)**

**Ballistic Table — BDU-33 Low Drag Bomb**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	1500	400	3.09	1538	2148	47	77	1.86	-1.85	2.43	5.2	0.2
40	1500	420	2.97	1554	2160	47	72	1.76	-1.75	2.32	5.0	0.2
40	1500	440	2.86	1569	2171	46	67	1.67	-1.66	2.23	4.8	0.2
40	1500	460	2.76	1582	2180	46	63	1.59	-1.58	2.14	4.7	0.2
40	1500	480	2.66	1594	2189	45	59	1.51	-1.50	2.05	4.5	0.2
40	1500	500	2.57	1605	2197	45	56	1.44	-1.44	1.98	4.3	0.2
40	1500	520	2.49	1615	2204	45	53	1.38	-1.38	1.91	4.2	0.1
40	1500	540	2.41	1624	2211	45	50	1.33	-1.32	1.84	4.1	0.2
40	1500	560	2.34	1633	2217	44	47	1.28	-1.27	1.79	4.0	0.2
40	1500	580	2.28	1640	2222	44	45	1.23	-1.23	1.73	3.9	0.2
40	1500	600	2.22	1647	2227	44	43	1.19	-1.19	1.69	3.8	0.2
40	2000	400	4.02	1990	2821	49	92	1.92	-1.90	2.41	6.8	0.3
40	2000	420	3.87	2015	2839	48	86	1.81	-1.79	2.31	6.5	0.3
40	2000	440	3.74	2037	2855	48	80	1.71	-1.70	2.21	6.3	0.3
40	2000	460	3.61	2058	2870	47	75	1.63	-1.62	2.12	6.1	0.3
40	2000	480	3.49	2077	2883	47	70	1.55	-1.54	2.04	5.9	0.2
40	2000	500	3.38	2094	2896	46	66	1.48	-1.47	1.97	5.7	0.2
40	2000	520	3.27	2110	2907	46	62	1.42	-1.41	1.90	5.5	0.2
40	2000	540	3.18	2124	2917	46	59	1.36	-1.35	1.84	5.4	0.2
40	2000	560	3.09	2136	2926	45	56	1.31	-1.30	1.79	5.2	0.2
40	2000	580	3.02	2148	2935	45	54	1.27	-1.26	1.74	5.1	0.3
40	2000	600	2.95	2158	2942	45	51	1.23	-1.22	1.69	5.0	0.3
40	2500	400	4.91	2418	3478	50	106	1.96	-1.94	2.39	8.3	0.4
40	2500	420	4.74	2452	3502	49	99	1.85	-1.84	2.29	8.0	0.4
40	2500	440	4.58	2484	3524	49	92	1.75	-1.74	2.20	7.7	0.4
40	2500	460	4.43	2513	3545	48	86	1.67	-1.65	2.11	7.5	0.4
40	2500	480	4.29	2539	3563	48	81	1.59	-1.57	2.03	7.3	0.3
40	2500	500	4.16	2563	3581	47	76	1.51	-1.50	1.96	7.0	0.3
40	2500	520	4.04	2585	3596	47	72	1.45	-1.44	1.90	6.8	0.3
40	2500	540	3.93	2605	3610	47	68	1.39	-1.38	1.84	6.6	0.3
40	2500	560	3.83	2623	3623	46	65	1.34	-1.33	1.79	6.5	0.4
40	2500	580	3.74	2639	3635	46	62	1.30	-1.29	1.74	6.3	0.4
40	2500	600	3.66	2653	3645	46	59	1.26	-1.25	1.70	6.2	0.4
40	3000	400	5.77	2825	4121	51	119	2.00	-1.98	2.37	9.7	0.5
40	3000	420	5.58	2870	4152	51	111	1.89	-1.97	2.27	9.4	0.5
40	3000	440	5.40	2911	4180	50	104	1.79	-1.77	2.18	9.1	0.5
40	3000	460	5.23	2949	4207	50	97	1.70	-1.69	2.10	8.8	0.5
40	3000	480	5.07	2983	4231	49	91	1.62	-1.60	2.02	8.6	0.5
40	3000	500	4.92	3015	4253	48	86	1.54	-1.53	1.96	8.3	0.4
40	3000	520	4.78	3044	4274	48	81	1.48	-1.47	1.89	8.1	0.4
40	3000	540	4.66	3069	4292	48	77	1.42	-1.41	1.84	7.9	0.5
40	3000	560	4.55	3093	4309	47	73	1.37	-1.36	1.78	7.7	0.5
40	3000	580	4.45	3113	4324	47	70	1.32	-1.32	1.74	7.5	0.5
40	3000	600	4.36	3133	4337	47	67	1.28	-1.28	1.70	7.4	0.6
40	3500	400	6.60	3215	4752	53	131	2.04	-2.02	2.35	11.1	0.7
40	3500	420	6.39	3270	4790	52	123	1.93	-1.91	2.25	10.8	0.6
40	3500	440	6.19	3321	4825	51	115	1.82	-1.81	2.17	10.5	0.6
40	3500	460	6.01	3368	4857	51	108	1.73	-1.72	2.09	10.1	0.6
40	3500	480	5.83	3411	4887	50	101	1.65	-1.63	2.02	9.9	0.6
40	3500	500	5.67	3451	4915	49	96	1.57	-1.56	1.95	9.6	0.6
40	3500	520	5.51	3487	4940	49	90	1.51	-1.49	1.89	9.3	0.6
40	3500	540	5.38	3519	4963	49	86	1.45	-1.44	1.83	9.1	0.6
40	3500	560	5.26	3548	4984	48	82	1.40	-1.38	1.78	8.9	0.6
40	3500	580	5.16	3573	5002	48	78	1.35	-1.34	1.74	8.7	0.7
40	3500	600	5.06	3597	5019	48	75	1.31	-1.30	1.70	8.5	0.7
40	4000	400	7.40	3588	5374	54	143	2.07	-2.05	2.33	12.5	0.8
40	4000	420	7.17	3654	5418	53	134	1.96	-1.94	2.24	12.1	0.8
40	4000	440	6.96	3715	5459	52	125	1.85	-1.93	2.15	11.8	0.7
40	4000	460	6.76	3772	5498	52	118	1.76	-1.74	2.08	11.4	0.7
40	4000	480	6.57	3824	5534	51	111	1.68	-1.66	2.01	11.1	0.7
40	4000	500	6.39	3871	5567	50	105	1.60	-1.59	1.94	10.8	0.7
40	4000	520	6.23	3915	5597	50	99	1.53	-1.52	1.88	10.5	0.7
40	4000	540	6.09	3953	5624	49	94	1.47	-1.46	1.83	10.3	0.7
40	4000	560	5.96	3988	5649	49	90	1.42	-1.41	1.78	10.1	0.8
40	4000	580	5.85	4019	5670	49	86	1.38	-1.37	1.74	9.9	0.8
40	4000	600	5.74	4048	5691	48	82	1.34	-1.33	1.71	9.7	0.9

**Figure 6-65 (Sheet 15 of 20)**

## Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	4500	400	8.17	3947	5986	55	154	2.10	-2.08	2.31	13.8	0.9
40	4500	420	7.94	4024	6037	54	144	1.99	-1.96	2.22	13.4	0.9
40	4500	440	7.71	4096	6085	53	135	1.88	-1.86	2.14	13.0	0.9
40	4500	460	7.49	4162	6129	53	127	1.79	-1.77	2.07	12.7	0.9
40	4500	480	7.29	4223	6171	52	120	1.70	-1.68	2.00	12.3	0.8
40	4500	500	7.10	4279	6209	51	113	1.62	-1.61	1.93	12.0	0.8
40	4500	520	6.93	4330	6245	51	108	1.56	-1.54	1.88	11.7	0.8
40	4500	540	6.78	4375	6276	50	102	1.50	-1.48	1.83	11.5	0.9
40	4500	560	6.65	4416	6305	50	98	1.45	-1.43	1.78	11.2	0.9
40	4500	580	6.53	4452	6330	50	94	1.40	-1.39	1.74	11.0	1.0
40	4500	600	6.42	4485	6353	49	90	1.36	-1.35	1.71	10.9	1.1
40	5000	400	8.93	4293	6590	56	164	2.13	-2.10	2.29	15.1	1.1
40	5000	420	8.68	4381	6648	55	154	2.01	-1.99	2.21	14.7	1.0
40	5000	440	8.44	4463	6702	54	145	1.91	-1.88	2.13	14.3	1.0
40	5000	460	8.21	4539	6753	53	137	1.81	-1.79	2.06	13.9	1.0
40	5000	480	8.00	4609	6800	53	129	1.72	-1.71	1.99	13.5	1.0
40	5000	500	7.80	4673	6844	52	122	1.65	-1.63	1.93	13.2	1.0
40	5000	520	7.62	4732	6884	52	116	1.58	-1.56	1.87	12.9	1.0
40	5000	540	7.46	4784	6920	51	110	1.52	-1.51	1.82	12.6	1.0
40	5000	560	7.32	4831	6952	51	105	1.47	-1.46	1.78	12.4	1.1
40	5000	580	7.20	4872	6981	50	101	1.43	-1.41	1.74	12.2	1.2
40	5000	600	7.09	4910	7008	50	97	1.39	-1.37	1.71	12.0	1.3
40	5500	400	9.67	4627	7188	57	174	2.15	-2.13	2.27	16.3	1.2
40	5500	420	9.40	4726	7252	56	164	2.03	-2.01	2.19	15.9	1.2
40	5500	440	9.15	4818	7312	55	154	1.93	-1.91	2.12	15.5	1.2
40	5500	460	8.91	4904	7369	54	145	1.83	-1.81	2.04	15.1	1.1
40	5500	480	8.69	4983	7422	54	137	1.75	-1.73	1.98	14.7	1.1
40	5500	500	8.48	5056	7471	53	130	1.67	-1.65	1.92	14.3	1.1
40	5500	520	8.30	5122	7516	52	124	1.60	-1.59	1.87	14.0	1.2
40	5500	540	8.13	5181	7556	52	118	1.54	-1.53	1.82	13.7	1.2
40	5500	560	7.99	5234	7592	52	113	1.49	-1.48	1.78	13.5	1.3
40	5500	580	7.87	5280	7624	51	109	1.45	-1.43	1.74	13.3	1.4
40	5500	600	7.75	5323	7654	51	104	1.41	-1.40	1.71	13.1	1.5
40	6000	400	10.38	4950	7778	58	184	2.17	-2.15	2.26	17.5	1.4
40	6000	420	10.11	5060	7849	57	173	2.06	-2.03	2.18	17.1	1.4
40	6000	440	9.85	5163	7915	56	163	1.95	-1.93	2.10	16.6	1.3
40	6000	460	9.60	5258	7978	55	154	1.85	-1.83	2.03	16.2	1.3
40	6000	480	9.37	5347	8037	54	146	1.77	-1.75	1.97	15.8	1.3
40	6000	500	9.15	5429	8091	54	138	1.69	-1.67	1.91	15.5	1.3
40	6000	520	8.96	5502	8141	53	131	1.62	-1.61	1.86	15.2	1.3
40	6000	540	8.79	5568	8185	53	125	1.56	-1.55	1.82	14.9	1.4
40	6000	560	8.65	5625	8225	52	120	1.51	-1.50	1.78	14.6	1.5
40	6000	580	8.53	5677	8260	52	116	1.47	-1.46	1.74	14.4	1.6
40	6000	600	8.41	5725	8293	52	111	1.43	-1.42	1.71	14.2	1.7
40	6500	400	11.08	5263	8364	58	193	2.19	-2.17	2.24	18.7	1.6
40	6500	420	10.80	5384	8440	58	182	2.08	-2.05	2.16	18.3	1.5
40	6500	440	10.53	5497	8513	57	172	1.97	-1.95	2.09	17.8	1.5
40	6500	460	10.27	5602	8581	56	162	1.87	-1.85	2.02	17.4	1.5
40	6500	480	10.03	5700	8646	55	154	1.79	-1.77	1.96	17.0	1.5
40	6500	500	9.81	5790	8705	55	146	1.71	-1.69	1.91	16.6	1.5
40	6500	520	9.62	5871	8759	54	139	1.64	-1.62	1.86	16.3	1.5
40	6500	540	9.45	5943	8808	54	133	1.58	-1.57	1.81	16.0	1.6
40	6500	560	9.30	6007	8850	53	127	1.53	-1.52	1.78	15.7	1.7
40	6500	580	9.17	6064	8889	53	123	1.49	-1.48	1.74	15.5	1.9
40	6500	600	9.05	6117	8926	52	118	1.45	-1.44	1.71	15.3	2.0
40	7000	400	11.77	5567	8944	59	202	2.21	-2.18	2.22	19.9	1.7
40	7000	420	11.48	5699	9026	58	190	2.10	-2.07	2.15	19.4	1.7
40	7000	440	11.20	5822	9105	57	180	1.99	-1.96	2.08	18.9	1.7
40	7000	460	10.93	5937	9179	57	170	1.89	-1.87	2.01	18.5	1.6
40	7000	480	10.69	6044	9249	56	161	1.80	-1.78	1.95	18.1	1.6
40	7000	500	10.46	6143	9313	55	153	1.73	-1.71	1.90	17.7	1.6
40	7000	520	10.27	6230	9371	55	146	1.66	-1.64	1.85	17.4	1.7
40	7000	540	10.09	6310	9424	54	140	1.60	-1.59	1.81	17.1	1.8
40	7000	560	9.95	6378	9470	54	134	1.55	-1.54	1.78	16.8	1.9
40	7000	580	9.82	6440	9512	53	130	1.51	-1.49	1.74	16.6	2.1
40	7000	600	9.69	6498	9551	53	125	1.47	-1.46	1.71	16.4	2.2

**Figure 6-65 (Sheet 16 of 20)**

**Ballistic Table — BDU-33 Low Drag Bomb**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	7500	400	12.44	5863	9520	60	210	2.23	-2.20	2.21	21.0	1.9
40	7500	420	12.14	6005	9608	59	198	2.11	-2.09	2.13	20.5	1.8
40	7500	440	11.85	6133	9692	58	188	2.01	-1.98	2.07	20.0	1.8
40	7500	460	11.58	6263	9771	57	178	1.91	-1.89	2.00	19.6	1.8
40	7500	480	11.33	6379	9846	57	169	1.82	-1.80	1.94	19.2	1.8
40	7500	500	11.10	6486	9915	56	160	1.74	-1.73	1.89	18.8	1.8
40	7500	520	10.91	6580	9978	55	153	1.68	-1.66	1.85	18.4	1.9
40	7500	540	10.73	6666	10034	55	147	1.62	-1.60	1.81	18.1	2.0
40	7500	560	10.58	6740	10083	55	141	1.57	-1.56	1.77	17.9	2.2
40	7500	580	10.45	6807	10129	54	136	1.53	-1.51	1.74	17.7	2.3
40	7500	600	10.32	6870	10171	54	132	1.49	-1.47	1.72	17.4	2.5
40	8000	400	13.09	6150	10091	61	218	2.25	-2.22	2.19	22.1	2.1
40	8000	420	12.79	6303	10185	60	206	2.13	-2.10	2.12	21.6	2.0
40	8000	440	12.50	6447	10274	59	195	2.02	-2.00	2.06	21.1	2.0
40	8000	460	12.22	6581	10359	58	185	1.92	-1.90	1.99	20.7	2.0
40	8000	480	11.97	6706	10439	57	176	1.84	-1.82	1.94	20.2	2.0
40	8000	500	11.74	6820	10513	57	167	1.76	-1.74	1.89	19.8	2.0
40	8000	520	11.53	6922	10579	56	160	1.69	-1.68	1.84	19.5	2.1
40	8000	540	11.36	7014	10639	56	153	1.64	-1.62	1.80	19.2	2.2
40	8000	560	11.21	7093	10691	55	148	1.59	-1.57	1.77	18.9	2.4
40	8000	580	11.08	7165	10740	55	143	1.55	-1.53	1.74	18.7	2.6
40	8000	600	10.95	7233	10785	54	138	1.51	-1.49	1.72	18.5	2.8
40	8500	400	13.74	6431	10658	61	226	2.26	-2.23	2.18	23.2	2.2
40	8500	420	13.42	6594	10758	60	214	2.14	-2.12	2.11	22.7	2.2
40	8500	440	13.13	6747	10853	60	202	2.04	-2.01	2.04	22.2	2.2
40	8500	460	12.85	6891	10943	59	192	1.94	-1.92	1.98	21.7	2.2
40	8500	480	12.59	7025	11027	58	183	1.85	-1.83	1.93	21.3	2.2
40	8500	500	12.36	7147	11105	57	174	1.78	-1.76	1.88	20.9	2.2
40	8500	520	12.16	7255	11175	57	167	1.71	-1.69	1.84	20.5	2.3
40	8500	540	11.98	7353	11239	56	160	1.65	-1.64	1.80	20.2	2.5
40	8500	560	11.83	7437	11294	56	154	1.61	-1.59	1.77	20.0	2.7
40	8500	580	11.70	7514	11345	56	149	1.56	-1.55	1.74	19.8	2.9
40	8500	600	11.57	7587	11394	55	145	1.52	-1.51	1.72	19.6	3.0
40	9000	400	14.37	6704	11222	62	233	2.27	-2.24	2.16	24.3	2.4
40	9000	420	14.05	6878	11327	61	221	2.16	-2.13	2.10	23.7	2.4
40	9000	440	13.75	7041	11427	60	209	2.05	-2.03	2.03	23.2	2.3
40	9000	460	13.47	7194	11522	59	199	1.95	-1.93	1.98	22.8	2.3
40	9000	480	13.21	7336	11611	59	189	1.87	-1.85	1.92	22.3	2.4
40	9000	500	12.97	7466	11693	58	181	1.79	-1.77	1.87	21.9	2.4
40	9000	520	12.77	7581	11767	57	173	1.73	-1.71	1.83	21.6	2.6
40	9000	540	12.59	7685	11834	57	167	1.67	-1.65	1.80	21.3	2.7
40	9000	560	12.45	7773	11892	57	161	1.62	-1.61	1.77	21.0	2.9
40	9000	580	12.32	7855	11946	56	156	1.58	-1.56	1.74	20.8	3.1
40	9000	600	12.19	7933	11997	56	151	1.54	-1.53	1.72	20.6	3.3
40	9500	400	14.99	6971	11783	62	240	2.29	-2.26	2.15	25.3	2.6
40	9500	420	14.67	7155	11893	62	228	2.17	-2.14	2.08	24.8	2.5
40	9500	440	14.36	7328	11998	61	216	2.06	-2.04	2.02	24.3	2.5
40	9500	460	14.08	7490	12097	60	206	1.97	-1.94	1.97	23.8	2.5
40	9500	480	13.82	7640	12191	59	196	1.88	-1.86	1.92	23.4	2.6
40	9500	500	13.58	7777	12277	59	187	1.81	-1.79	1.87	23.0	2.6
40	9500	520	13.38	7899	12355	58	180	1.74	-1.72	1.83	22.6	2.8
40	9500	540	13.20	8008	12425	58	173	1.69	-1.67	1.80	22.3	3.0
40	9500	560	13.06	8101	12485	57	167	1.64	-1.62	1.77	22.1	3.2
40	9500	580	12.92	8189	12542	57	162	1.60	-1.58	1.74	21.8	3.4
40	9500	600	12.79	8271	12596	56	157	1.56	-1.54	1.72	21.6	3.6
40	10000	400	15.60	7232	12341	63	247	2.30	-2.27	2.14	26.4	2.8
40	10000	420	15.27	7426	12455	62	235	2.18	-2.15	2.07	25.8	2.7
40	10000	440	14.97	7608	12565	61	223	2.08	-2.05	2.01	25.3	2.7
40	10000	460	14.68	7779	12669	60	212	1.98	-1.96	1.96	24.8	2.7
40	10000	480	14.42	7937	12767	60	202	1.90	-1.87	1.91	24.4	2.8
40	10000	500	14.18	8082	12857	59	194	1.82	-1.80	1.86	24.0	2.9
40	10000	520	13.98	8209	12938	59	186	1.76	-1.74	1.83	23.6	3.0
40	10000	540	13.81	8324	13011	58	179	1.70	-1.68	1.79	23.3	3.2
40	10000	560	13.67	8422	13074	58	173	1.65	-1.64	1.77	23.1	3.5
40	10000	580	13.53	8514	13134	57	168	1.61	-1.60	1.74	22.9	3.7
40	10000	600	13.40	8601	13190	57	163	1.57	-1.56	1.72	22.6	3.9

**Figure 6-65 (Sheet 17 of 20)**

## Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	1500	400	2.86	1312	1993	51	70	1.99	-1.97	2.43	4.8	0.2
45	1500	420	2.75	1324	2001	51	65	1.88	-1.87	2.32	4.6	0.2
45	1500	440	2.64	1335	2008	50	61	1.78	-1.77	2.22	4.5	0.2
45	1500	460	2.54	1345	2015	50	57	1.70	-1.69	2.13	4.3	0.2
45	1500	480	2.45	1354	2021	50	54	1.62	-1.61	2.05	4.1	0.2
45	1500	500	2.37	1363	2027	49	51	1.55	-1.54	1.97	4.0	0.1
45	1500	520	2.29	1370	2032	49	48	1.48	-1.48	1.90	3.9	0.1
45	1500	540	2.22	1377	2036	49	45	1.43	-1.42	1.84	3.8	0.1
45	1500	560	2.15	1383	2040	49	43	1.38	-1.37	1.78	3.6	0.1
45	1500	580	2.09	1389	2044	49	41	1.33	-1.32	1.73	3.5	0.2
45	1500	600	2.04	1394	2048	48	39	1.29	-1.28	1.68	3.4	0.2
45	2000	400	3.73	1703	2627	53	82	2.03	-2.01	2.40	6.3	0.3
45	2000	420	3.59	1722	2639	52	77	1.92	-1.91	2.30	6.1	0.3
45	2000	440	3.46	1740	2651	52	72	1.82	-1.81	2.21	5.9	0.3
45	2000	460	3.34	1756	2661	51	67	1.73	-1.72	2.12	5.6	0.2
45	2000	480	3.22	1770	2671	51	63	1.65	-1.64	2.04	5.5	0.2
45	2000	500	3.12	1783	2679	50	59	1.58	-1.57	1.97	5.3	0.2
45	2000	520	3.02	1795	2687	50	56	1.51	-1.51	1.90	5.1	0.2
45	2000	540	2.93	1805	2694	50	53	1.46	-1.45	1.84	5.0	0.2
45	2000	560	2.85	1815	2701	50	50	1.40	-1.40	1.78	4.8	0.2
45	2000	580	2.77	1824	2707	49	48	1.36	-1.35	1.73	4.7	0.2
45	2000	600	2.71	1832	2712	49	46	1.31	-1.31	1.69	4.6	0.3
45	2500	400	4.58	2076	3250	54	94	2.07	-2.05	2.38	7.7	0.4
45	2500	420	4.41	2103	3267	53	88	1.96	-1.94	2.28	7.5	0.4
45	2500	440	4.26	2128	3283	53	82	1.86	-1.84	2.19	7.2	0.4
45	2500	460	4.11	2150	3297	52	77	1.77	-1.75	2.11	7.0	0.3
45	2500	480	3.98	2170	3311	52	72	1.68	-1.67	2.03	6.7	0.3
45	2500	500	3.85	2189	3323	51	68	1.61	-1.60	1.96	6.5	0.3
45	2500	520	3.73	2205	3334	51	64	1.54	-1.53	1.89	6.3	0.3
45	2500	540	3.63	2220	3344	51	61	1.48	-1.47	1.83	6.1	0.3
45	2500	560	3.53	2234	3353	50	58	1.43	-1.42	1.78	6.0	0.3
45	2500	580	3.45	2246	3361	50	55	1.38	-1.38	1.73	5.8	0.3
45	2500	600	3.37	2257	3368	50	53	1.34	-1.33	1.69	5.7	0.4
45	3000	400	5.39	2434	3863	55	105	2.10	-2.09	2.36	9.1	0.5
45	3000	420	5.21	2463	3885	54	98	1.99	-1.97	2.26	8.8	0.5
45	3000	440	5.03	2501	3906	54	92	1.89	-1.87	2.18	8.5	0.5
45	3000	460	4.87	2530	3924	53	86	1.80	-1.78	2.09	8.2	0.4
45	3000	480	4.71	2557	3942	53	81	1.71	-1.70	2.02	8.0	0.4
45	3000	500	4.57	2581	3957	52	76	1.64	-1.62	1.95	7.7	0.4
45	3000	520	4.43	2603	3972	52	72	1.57	-1.56	1.89	7.5	0.4
45	3000	540	4.31	2623	3985	52	68	1.51	-1.50	1.83	7.3	0.4
45	3000	560	4.21	2641	3997	51	65	1.45	-1.45	1.78	7.1	0.4
45	3000	580	4.11	2656	4007	51	62	1.41	-1.40	1.73	6.9	0.5
45	3000	600	4.02	2671	4017	51	59	1.37	-1.36	1.69	6.8	0.5
45	3500	400	6.18	2777	4468	56	116	2.14	-2.12	2.34	10.4	0.6
45	3500	420	5.99	2820	4495	55	109	2.02	-2.00	2.25	10.1	0.6
45	3500	440	5.78	2860	4520	55	102	1.92	-1.90	2.16	9.8	0.6
45	3500	460	5.60	2897	4543	54	95	1.82	-1.81	2.08	9.5	0.6
45	3500	480	5.43	2930	4565	54	90	1.74	-1.72	2.01	9.2	0.5
45	3500	500	5.27	2961	4584	53	85	1.66	-1.65	1.94	8.9	0.5
45	3500	520	5.12	2989	4602	53	80	1.59	-1.58	1.88	8.7	0.5
45	3500	540	4.99	3013	4618	52	76	1.53	-1.52	1.83	8.4	0.5
45	3500	560	4.87	3036	4633	52	72	1.48	-1.47	1.78	8.2	0.6
45	3500	580	4.77	3055	4646	52	69	1.43	-1.42	1.73	8.1	0.6
45	3500	600	4.67	3074	4658	52	66	1.39	-1.38	1.69	7.9	0.7
45	4000	400	6.95	3107	5065	57	126	2.16	-2.14	2.32	11.7	0.8
45	4000	420	6.73	3153	5097	56	118	2.05	-2.03	2.23	11.4	0.7
45	4000	440	6.51	3207	5127	56	111	1.94	-1.93	2.15	11.0	0.7
45	4000	460	6.32	3251	5155	55	104	1.85	-1.83	2.07	10.7	0.7
45	4000	480	6.13	3292	5181	55	98	1.76	-1.75	2.00	10.4	0.7
45	4000	500	5.95	3329	5204	54	92	1.68	-1.67	1.93	10.1	0.6
45	4000	520	5.80	3363	5226	54	87	1.61	-1.60	1.87	9.8	0.6
45	4000	540	5.66	3393	5245	53	83	1.55	-1.54	1.82	9.6	0.7
45	4000	560	5.53	3420	5263	53	79	1.50	-1.49	1.78	9.3	0.7
45	4000	580	5.42	3444	5278	53	76	1.46	-1.45	1.74	9.2	0.8
45	4000	600	5.32	3466	5293	52	72	1.41	-1.40	1.70	9.0	0.8

**Figure 6-65 (Sheet 18 of 20)**

**Ballistic Table — BDU-33 Low Drag Bomb**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	4500	400	7.69	3425	5655	58	136	2.19	-2.17	2.30	13.0	0.9
45	4500	420	7.46	3486	5692	57	127	2.07	-2.05	2.21	12.6	0.9
45	4500	440	7.23	3543	5727	57	120	1.97	-1.95	2.13	12.2	0.8
45	4500	460	7.02	3595	5760	56	112	1.87	-1.85	2.06	11.9	0.8
45	4500	480	6.81	3643	5790	55	106	1.78	-1.77	1.99	11.5	0.8
45	4500	500	6.63	3687	5817	55	100	1.71	-1.69	1.93	11.2	0.8
45	4500	520	6.46	3727	5843	54	95	1.64	-1.62	1.87	10.9	0.8
45	4500	540	6.31	3762	5865	54	90	1.58	-1.56	1.82	10.7	0.8
45	4500	560	6.18	3794	5886	54	86	1.52	-1.51	1.77	10.4	0.9
45	4500	580	6.06	3822	5904	53	82	1.48	-1.47	1.74	10.2	0.9
45	4500	600	5.95	3848	5921	53	79	1.44	-1.43	1.70	10.1	1.0
45	5000	400	8.42	3732	6239	59	145	2.21	-2.19	2.28	14.2	1.0
45	5000	420	8.17	3803	6282	58	136	2.10	-2.08	2.20	13.8	1.0
45	5000	440	7.93	3868	6322	57	128	1.99	-1.97	2.12	13.4	1.0
45	5000	460	7.70	3928	6359	57	120	1.89	-1.88	2.05	13.0	0.9
45	5000	480	7.49	3984	6393	56	114	1.80	-1.79	1.98	12.7	0.9
45	5000	500	7.29	4035	6425	56	107	1.73	-1.71	1.92	12.3	0.9
45	5000	520	7.11	4080	6454	55	102	1.66	-1.64	1.86	12.0	0.9
45	5000	540	6.96	4121	6480	55	97	1.60	-1.58	1.81	11.8	1.0
45	5000	560	6.82	4158	6503	54	93	1.54	-1.53	1.77	11.5	1.0
45	5000	580	6.70	4190	6524	54	89	1.50	-1.49	1.74	11.3	1.1
45	5000	600	6.58	4220	6543	54	85	1.46	-1.45	1.70	11.1	1.2
45	5500	400	9.13	4030	6818	60	154	2.24	-2.21	2.26	15.4	1.2
45	5500	420	8.86	4110	6866	59	145	2.12	-2.10	2.18	15.0	1.1
45	5500	440	8.61	4184	6910	58	136	2.01	-1.99	2.11	14.6	1.1
45	5500	460	8.37	4252	6952	58	128	1.91	-1.89	2.04	14.2	1.1
45	5500	480	8.15	4315	6991	57	121	1.82	-1.81	1.97	13.8	1.1
45	5500	500	7.94	4373	7027	56	115	1.75	-1.73	1.91	13.4	1.1
45	5500	520	7.76	4425	7059	56	109	1.68	-1.66	1.86	13.1	1.1
45	5500	540	7.59	4471	7088	55	104	1.62	-1.60	1.81	12.8	1.1
45	5500	560	7.45	4512	7114	55	99	1.56	-1.55	1.77	12.6	1.2
45	5500	580	7.33	4549	7137	55	95	1.52	-1.51	1.74	12.4	1.3
45	5500	600	7.21	4583	7159	54	91	1.48	-1.47	1.70	12.2	1.4
45	6000	400	9.82	4319	7393	60	162	2.26	-2.23	2.24	16.6	1.3
45	6000	420	9.54	4408	7445	60	153	2.14	-2.11	2.17	16.1	1.3
45	6000	440	9.28	4490	7494	59	144	2.03	-2.01	2.09	15.7	1.3
45	6000	460	9.03	4567	7540	58	136	1.93	-1.91	2.02	15.3	1.2
45	6000	480	8.80	4638	7583	58	128	1.84	-1.83	1.96	14.9	1.2
45	6000	500	8.59	4702	7623	57	122	1.76	-1.75	1.90	14.5	1.2
45	6000	520	8.40	4760	7659	57	116	1.70	-1.68	1.85	14.2	1.2
45	6000	540	8.22	4812	7692	56	110	1.64	-1.62	1.81	13.9	1.3
45	6000	560	8.08	4858	7720	56	106	1.58	-1.57	1.77	13.7	1.4
45	6000	580	7.95	4899	7746	55	101	1.54	-1.53	1.73	13.4	1.5
45	6000	600	7.83	4938	7771	55	98	1.50	-1.49	1.70	13.2	1.6
45	6500	400	10.50	4599	7962	61	171	2.27	-2.25	2.23	17.7	1.5
45	6500	420	10.21	4697	8020	60	161	2.15	-2.13	2.15	17.3	1.4
45	6500	440	9.94	4788	8073	60	151	2.05	-2.03	2.08	16.8	1.4
45	6500	460	9.68	4873	8124	59	143	1.95	-1.93	2.01	16.4	1.4
45	6500	480	9.44	4952	8171	58	135	1.86	-1.84	1.95	15.9	1.4
45	6500	500	9.22	5023	8215	58	128	1.78	-1.77	1.90	15.6	1.4
45	6500	520	9.02	5088	8254	57	122	1.71	-1.70	1.85	15.2	1.4
45	6500	540	8.85	5145	8290	57	117	1.65	-1.64	1.80	15.0	1.5
45	6500	560	8.70	5195	8321	56	112	1.60	-1.59	1.77	14.7	1.6
45	6500	580	8.57	5241	8350	56	108	1.56	-1.55	1.73	14.5	1.7
45	6500	600	8.44	5284	8377	56	104	1.52	-1.51	1.70	14.3	1.8
45	7000	400	11.16	4871	8528	62	178	2.29	-2.27	2.21	18.9	1.6
45	7000	420	10.87	4979	8590	61	168	2.17	-2.15	2.14	18.4	1.6
45	7000	440	10.58	5079	8648	60	159	2.06	-2.04	2.07	17.9	1.6
45	7000	460	10.32	5172	8703	60	150	1.96	-1.95	2.00	17.4	1.5
45	7000	480	10.07	5258	8755	59	142	1.88	-1.86	1.94	17.0	1.5
45	7000	500	9.84	5337	8802	58	135	1.80	-1.78	1.89	16.6	1.5
45	7000	520	9.64	5407	8845	58	128	1.73	-1.72	1.84	16.3	1.6
45	7000	540	9.46	5470	8884	57	123	1.67	-1.66	1.80	16.0	1.7
45	7000	560	9.32	5525	8918	57	118	1.62	-1.61	1.77	15.7	1.8
45	7000	580	9.18	5575	8949	57	114	1.58	-1.56	1.73	15.5	1.9
45	7000	600	9.05	5621	8978	56	110	1.54	-1.52	1.70	15.3	2.1

**Figure 6-65 (Sheet 19 of 20)**

# Ballistic Table — BDU-33 Low Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	7500	400	11.81	5137	9090	62	186	2.31	-2.28	2.20	20.0	1.8
45	7500	420	11.51	5253	9157	62	175	2.19	-2.16	2.12	19.4	1.8
45	7500	440	11.22	5362	9220	61	165	2.08	-2.06	2.06	19.0	1.7
45	7500	460	10.94	5463	9279	60	157	1.98	-1.96	1.99	18.5	1.7
45	7500	480	10.69	5557	9334	60	148	1.89	-1.87	1.93	18.1	1.7
45	7500	500	10.46	5642	9385	59	141	1.81	-1.80	1.88	17.7	1.7
45	7500	520	10.25	5719	9431	58	135	1.75	-1.73	1.84	17.3	1.8
45	7500	540	10.08	5787	9473	58	129	1.69	-1.67	1.80	17.0	1.9
45	7500	560	9.93	5846	9509	58	124	1.64	-1.62	1.76	16.8	2.0
45	7500	580	9.79	5901	9543	57	119	1.59	-1.58	1.73	16.5	2.2
45	7500	600	9.66	5951	9574	57	115	1.55	-1.54	1.70	16.3	2.3
45	8000	400	12.45	5395	9649	63	193	2.32	-2.29	2.16	21.0	2.0
45	8000	420	12.14	5521	9720	62	182	2.20	-2.18	2.11	20.5	1.9
45	8000	440	11.84	5633	9737	62	172	2.09	-2.07	2.04	20.0	1.9
45	8000	460	11.56	5748	9851	61	163	1.99	-1.93	1.99	19.5	1.9
45	8000	480	11.30	5849	9910	60	155	1.91	-1.89	1.93	19.1	1.9
45	8000	500	11.07	5941	9965	60	147	1.83	-1.81	1.88	18.7	1.9
45	8000	520	10.86	6023	10014	59	141	1.76	-1.75	1.93	18.4	2.0
45	8000	540	10.68	6097	10059	59	135	1.70	-1.69	1.79	18.0	2.1
45	8000	560	10.53	6160	10097	58	130	1.66	-1.64	1.76	17.8	2.2
45	8000	580	10.39	6219	10133	58	125	1.61	-1.60	1.73	17.6	2.4
45	8000	600	10.26	6274	10167	58	121	1.57	-1.56	1.71	17.3	2.5
45	8500	400	13.08	5649	10205	64	200	2.33	-2.31	2.17	22.1	2.1
45	8500	420	12.76	5782	10290	63	189	2.21	-2.19	2.10	21.6	2.1
45	8500	440	12.45	5903	10352	62	179	2.11	-2.08	2.03	21.0	2.1
45	8500	460	12.17	6026	10419	61	169	2.01	-1.99	1.97	20.6	2.0
45	8500	480	11.90	6134	10482	61	161	1.92	-1.90	1.92	20.1	2.0
45	8500	500	11.67	6233	10540	60	153	1.84	-1.83	1.87	19.7	2.1
45	8500	520	11.46	6321	10593	60	147	1.78	-1.76	1.83	19.4	2.2
45	8500	540	11.28	6400	10640	59	141	1.72	-1.70	1.79	19.1	2.3
45	8500	560	11.13	6468	10691	59	136	1.67	-1.65	1.76	18.8	2.5
45	8500	580	10.99	6531	10719	58	131	1.63	-1.61	1.73	18.6	2.6
45	8500	600	10.85	6590	10755	58	127	1.59	-1.57	1.71	18.3	2.8
45	9000	400	13.69	5894	10758	64	206	2.35	-2.32	2.15	23.1	2.3
45	9000	420	13.37	6038	10838	63	195	2.23	-2.20	2.08	22.6	2.3
45	9000	440	13.06	6172	10913	63	185	2.12	-2.10	2.02	22.1	2.2
45	9000	460	12.77	6298	10985	62	176	2.02	-2.00	1.96	21.6	2.2
45	9000	480	12.50	6413	11051	61	167	1.94	-1.92	1.91	21.1	2.2
45	9000	500	12.26	6517	11113	61	159	1.86	-1.84	1.86	20.7	2.3
45	9000	520	12.05	6612	11168	60	152	1.79	-1.78	1.82	20.4	2.4
45	9000	540	11.87	6696	11218	60	146	1.73	-1.72	1.79	20.1	2.5
45	9000	560	11.72	6768	11261	59	141	1.69	-1.67	1.76	19.8	2.7
45	9000	580	11.58	6835	11301	59	136	1.64	-1.63	1.73	19.6	2.9
45	9000	600	11.44	6893	11340	59	132	1.60	-1.59	1.71	19.3	3.1
45	9500	400	14.30	6135	11309	65	213	2.36	-2.33	2.14	24.2	2.5
45	9500	420	13.97	6287	11392	64	201	2.24	-2.22	2.07	23.6	2.4
45	9500	440	13.65	6430	11472	63	191	2.13	-2.11	2.01	23.1	2.4
45	9500	460	13.36	6563	11547	62	181	2.03	-2.01	1.96	22.6	2.4
45	9500	480	13.09	6686	11617	62	173	1.95	-1.93	1.90	22.1	2.4
45	9500	500	12.85	6793	11682	61	165	1.87	-1.85	1.86	21.7	2.5
45	9500	520	12.64	6897	11740	61	158	1.81	-1.79	1.82	21.4	2.6
45	9500	540	12.46	6985	11792	60	152	1.75	-1.73	1.79	21.1	2.8
45	9500	560	12.31	7062	11837	60	147	1.70	-1.69	1.76	20.8	3.0
45	9500	580	12.17	7133	11880	60	142	1.66	-1.64	1.73	20.6	3.2
45	9500	600	12.03	7201	11920	59	137	1.62	-1.60	1.71	20.3	3.4
45	10000	400	14.89	6371	11857	65	219	2.37	-2.34	2.12	25.2	2.6
45	10000	420	14.56	6532	11944	64	207	2.25	-2.23	2.06	24.6	2.6
45	10000	440	14.24	6683	12028	64	197	2.14	-2.12	2.00	24.1	2.6
45	10000	460	13.95	6824	12106	63	187	2.05	-2.03	1.95	23.6	2.6
45	10000	480	13.68	6953	12180	62	178	1.96	-1.94	1.90	23.1	2.6
45	10000	500	13.44	7071	12248	62	171	1.89	-1.87	1.85	22.7	2.7
45	10000	520	13.23	7176	12309	61	164	1.82	-1.80	1.82	22.4	2.8
45	10000	540	13.05	7269	12363	61	157	1.76	-1.75	1.79	22.1	3.0
45	10000	560	12.90	7350	12410	60	152	1.72	-1.70	1.76	21.8	3.2
45	10000	580	12.75	7425	12455	60	147	1.67	-1.66	1.73	21.5	3.4
45	10000	600	12.61	7496	12498	60	143	1.63	-1.62	1.71	21.3	3.6

Figure 6-65 (Sheet 20 of 20)



# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	100	400	2.18	1187	1191	9	83	0.23	-0.27	3.09	3.7	0.7
0	100	420	2.19	1233	1242	8	85	0.26	-0.25	2.98	3.7	0.8
0	100	440	2.20	1288	1292	8	82	0.24	-0.23	2.88	3.7	0.8
0	100	460	2.21	1337	1341	8	79	0.23	-0.21	2.79	3.7	0.8
0	100	480	2.23	1395	1399	3	76	0.21	-0.20	2.71	3.8	0.9
0	100	500	2.24	1433	1436	7	74	0.20	-0.19	2.63	3.8	0.9
0	100	520	2.25	1480	1483	7	71	0.19	-0.18	2.56	3.8	1.0
0	100	540	2.26	1525	1529	7	69	0.18	-0.17	2.50	3.8	1.0
0	100	560	2.27	1570	1574	7	67	0.17	-0.16	2.44	3.8	1.0
0	100	580	2.28	1615	1618	7	65	0.16	-0.15	2.38	3.9	1.1
0	100	600	2.29	1658	1661	7	64	0.15	-0.14	2.33	3.9	1.1
0	150	400	2.82	1460	1467	11	107	0.36	-0.34	3.25	4.8	1.1
0	150	420	2.84	1519	1527	11	102	0.33	-0.31	3.14	4.8	1.2
0	150	440	2.86	1578	1585	11	99	0.31	-0.29	3.04	4.8	1.2
0	150	460	2.87	1635	1642	10	95	0.29	-0.27	2.95	4.9	1.3
0	150	480	2.89	1691	1697	10	92	0.27	-0.26	2.87	4.9	1.4
0	150	500	2.90	1745	1752	10	89	0.26	-0.24	2.80	4.9	1.4
0	150	520	2.92	1799	1805	10	86	0.24	-0.23	2.73	4.9	1.5
0	150	540	2.93	1851	1857	10	84	0.23	-0.22	2.67	5.0	1.5
0	150	560	2.94	1903	1908	9	82	0.22	-0.21	2.61	5.0	1.6
0	150	580	2.96	1953	1958	9	80	0.21	-0.20	2.55	5.0	1.6
0	150	600	2.97	2002	2007	9	78	0.20	-0.19	2.50	5.0	1.7
0	200	400	3.39	1676	1688	14	123	0.43	-0.40	3.38	5.7	1.5
0	200	420	3.40	1742	1753	13	118	0.40	-0.37	3.28	5.7	1.6
0	200	440	3.42	1806	1817	13	114	0.37	-0.35	3.18	5.8	1.7
0	200	460	3.44	1869	1880	13	110	0.35	-0.33	3.09	5.8	1.7
0	200	480	3.46	1930	1941	13	106	0.33	-0.31	3.01	5.8	1.8
0	200	500	3.47	1990	2000	12	103	0.31	-0.29	2.93	5.9	1.9
0	200	520	3.49	2048	2058	12	100	0.30	-0.28	2.87	5.9	2.0
0	200	540	3.51	2105	2115	12	98	0.28	-0.27	2.80	5.9	2.0
0	200	560	3.53	2161	2170	12	95	0.27	-0.25	2.75	6.0	2.1
0	200	580	3.54	2215	2224	12	93	0.26	-0.24	2.69	6.0	2.2
0	200	600	3.56	2267	2276	11	91	0.25	-0.23	2.64	6.0	2.2
0	250	400	3.88	1857	1874	16	137	0.50	-0.46	3.50	6.6	1.9
0	250	420	3.90	1923	1944	16	132	0.46	-0.43	3.39	6.6	2.0
0	250	440	3.92	1997	2012	15	128	0.43	-0.41	3.29	6.6	2.1
0	250	460	3.95	2064	2079	15	124	0.41	-0.38	3.21	6.7	2.2
0	250	480	3.97	2129	2144	15	120	0.39	-0.36	3.13	6.7	2.3
0	250	500	3.99	2193	2207	15	116	0.37	-0.34	3.05	6.7	2.4
0	250	520	4.01	2254	2268	14	113	0.35	-0.33	2.98	6.8	2.4
0	250	540	4.03	2315	2328	14	110	0.33	-0.31	2.92	6.8	2.5
0	250	560	4.05	2373	2386	14	108	0.32	-0.30	2.86	6.8	2.6
0	250	580	4.06	2430	2443	14	105	0.30	-0.29	2.81	6.9	2.7
0	250	600	4.08	2496	2498	14	103	0.29	-0.28	2.76	6.9	2.8
0	300	400	4.34	2014	2036	18	151	0.56	-0.52	3.60	7.3	2.3
0	300	420	4.36	2089	2110	18	146	0.53	-0.49	3.49	7.4	2.4
0	300	440	4.39	2161	2182	18	141	0.49	-0.46	3.40	7.4	2.5
0	300	460	4.41	2231	2252	17	137	0.47	-0.44	3.31	7.5	2.6
0	300	480	4.43	2300	2319	17	133	0.44	-0.41	3.23	7.5	2.7
0	300	500	4.46	2366	2385	17	129	0.42	-0.39	3.16	7.5	2.8
0	300	520	4.48	2431	2450	16	125	0.40	-0.38	3.09	7.6	2.9
0	300	540	4.50	2494	2512	16	122	0.38	-0.36	3.03	7.6	3.0
0	300	560	4.52	2555	2572	16	119	0.36	-0.34	2.97	7.6	3.1
0	300	580	4.54	2614	2631	16	117	0.35	-0.33	2.92	7.7	3.2
0	300	600	4.56	2672	2689	16	114	0.34	-0.32	2.87	7.7	3.3
0	350	400	4.76	2152	2180	21	165	0.63	-0.58	3.69	8.1	2.7
0	350	420	4.79	2230	2257	20	159	0.59	-0.55	3.59	8.1	2.8
0	350	440	4.82	2306	2332	20	154	0.55	-0.52	3.49	8.1	2.9
0	350	460	4.84	2379	2405	19	149	0.52	-0.49	3.40	8.2	3.0
0	350	480	4.87	2450	2475	19	145	0.50	-0.46	3.32	8.2	3.1
0	350	500	4.89	2519	2543	19	141	0.47	-0.44	3.25	8.3	3.2
0	350	520	4.92	2586	2610	19	137	0.45	-0.42	3.18	8.3	3.3
0	350	540	4.94	2651	2674	18	134	0.43	-0.40	3.12	8.3	3.4
0	350	560	4.96	2714	2736	18	131	0.41	-0.39	3.06	8.4	3.5
0	350	580	4.98	2775	2797	18	128	0.40	-0.37	3.01	8.4	3.6
0	350	600	5.01	2835	2856	18	125	0.38	-0.36	2.96	8.5	3.7

Figure 6-66 (Sheet 1 of 21)

## Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	400	400	5.16	2276	2311	23	177	0.69	-0.64	3.78	8.7	3.0
0	400	420	5.19	2357	2390	22	171	0.65	-0.60	3.67	8.8	3.2
0	400	440	5.22	2435	2468	22	166	0.61	-0.57	3.57	8.8	3.3
0	400	460	5.25	2511	2543	21	161	0.58	-0.54	3.49	8.9	3.4
0	400	480	5.28	2584	2615	21	156	0.55	-0.51	3.41	8.9	3.5
0	400	500	5.30	2655	2685	21	152	0.52	-0.49	3.34	9.0	3.6
0	400	520	5.33	2724	2753	21	148	0.50	-0.47	3.27	9.0	3.8
0	400	540	5.35	2791	2819	20	145	0.48	-0.45	3.21	9.0	3.9
0	400	560	5.38	2856	2884	20	142	0.46	-0.43	3.15	9.1	4.0
0	400	580	5.40	2918	2946	20	139	0.44	-0.41	3.10	9.1	4.1
0	400	600	5.42	2979	3006	20	136	0.43	-0.40	3.05	9.2	4.2
0	450	400	5.54	2389	2431	25	189	0.75	-0.70	3.85	9.4	3.4
0	450	420	5.57	2472	2513	24	183	0.71	-0.66	3.75	9.4	3.5
0	450	440	5.60	2553	2592	24	177	0.67	-0.62	3.65	9.5	3.7
0	450	460	5.63	2630	2669	23	172	0.63	-0.59	3.57	9.5	3.8
0	450	480	5.66	2706	2743	23	167	0.60	-0.56	3.49	9.6	3.9
0	450	500	5.69	2779	2815	23	163	0.57	-0.54	3.41	9.6	4.1
0	450	520	5.72	2849	2885	22	159	0.55	-0.51	3.35	9.7	4.2
0	450	540	5.74	2917	2952	22	155	0.53	-0.49	3.29	9.7	4.3
0	450	560	5.77	2984	3017	22	152	0.51	-0.47	3.23	9.7	4.4
0	450	580	5.79	3048	3081	22	149	0.49	-0.46	3.18	9.8	4.5
0	450	600	5.82	3110	3142	22	146	0.47	-0.44	3.13	9.8	4.6
0	500	400	5.90	2492	2542	26	201	0.82	-0.76	3.93	10.0	3.7
0	500	420	5.94	2577	2626	26	195	0.77	-0.71	3.82	10.0	3.9
0	500	440	5.97	2660	2707	26	189	0.73	-0.67	3.73	10.1	4.0
0	500	460	6.00	2740	2785	25	183	0.69	-0.64	3.64	10.1	4.2
0	500	480	6.03	2817	2861	25	178	0.65	-0.61	3.56	10.2	4.3
0	500	500	6.06	2891	2934	25	174	0.62	-0.58	3.49	10.2	4.5
0	500	520	6.09	2963	3005	24	170	0.60	-0.56	3.42	10.3	4.6
0	500	540	6.11	3033	3074	24	166	0.57	-0.54	3.36	10.3	4.7
0	500	560	6.14	3100	3140	24	162	0.55	-0.52	3.30	10.4	4.8
0	500	580	6.17	3166	3205	24	159	0.53	-0.50	3.25	10.4	5.0
0	500	600	6.19	3229	3267	23	156	0.51	-0.48	3.20	10.5	5.1
0	550	400	6.25	2587	2645	28	212	0.88	-0.81	3.99	10.6	4.1
0	550	420	6.28	2675	2731	28	206	0.83	-0.77	3.89	10.6	4.3
0	550	440	6.32	2759	2814	27	200	0.78	-0.73	3.79	10.7	4.4
0	550	460	6.35	2841	2894	27	194	0.74	-0.69	3.71	10.7	4.6
0	550	480	6.38	2919	2971	27	189	0.71	-0.66	3.63	10.8	4.7
0	550	500	6.41	2995	3045	26	184	0.67	-0.63	3.56	10.8	4.8
0	550	520	6.44	3068	3117	26	180	0.65	-0.60	3.49	10.9	5.0
0	550	540	6.47	3139	3187	26	176	0.62	-0.58	3.43	10.9	5.1
0	550	560	6.50	3208	3255	26	172	0.60	-0.56	3.37	11.0	5.2
0	550	580	6.52	3274	3320	25	169	0.58	-0.54	3.32	11.0	5.4
0	550	600	6.55	3338	3383	25	165	0.56	-0.52	3.27	11.1	5.5
0	600	400	6.58	2676	2743	30	224	0.94	-0.86	4.06	11.1	4.4
0	600	420	6.62	2766	2830	30	216	0.88	-0.82	3.95	11.2	4.6
0	600	440	6.65	2852	2914	29	210	0.84	-0.78	3.86	11.2	4.8
0	600	460	6.69	2934	2995	29	204	0.79	-0.74	3.77	11.3	4.9
0	600	480	6.72	3014	3074	28	199	0.76	-0.70	3.69	11.4	5.1
0	600	500	6.75	3092	3149	28	194	0.72	-0.67	3.62	11.4	5.2
0	600	520	6.78	3166	3222	28	190	0.69	-0.65	3.56	11.5	5.4
0	600	540	6.81	3238	3293	28	186	0.67	-0.62	3.49	11.5	5.5
0	600	560	6.84	3307	3361	27	182	0.64	-0.60	3.44	11.6	5.6
0	600	580	6.87	3375	3427	27	178	0.62	-0.58	3.38	11.6	5.8
0	600	600	6.89	3439	3491	27	175	0.60	-0.56	3.34	11.6	5.9
0	650	400	6.90	2760	2835	32	234	1.00	-0.92	4.12	11.7	4.8
0	650	420	6.94	2850	2924	31	227	0.94	-0.87	4.01	11.7	4.9
0	650	440	6.98	2938	3009	31	220	0.89	-0.83	3.92	11.8	5.1
0	650	460	7.01	3022	3091	30	214	0.85	-0.79	3.83	11.9	5.3
0	650	480	7.05	3103	3171	30	209	0.81	-0.75	3.75	11.9	5.4
0	650	500	7.08	3181	3247	30	204	0.77	-0.72	3.68	12.0	5.6
0	650	520	7.11	3257	3321	30	199	0.74	-0.69	3.62	12.0	5.7
0	650	540	7.14	3330	3393	29	195	0.71	-0.67	3.56	12.1	5.9
0	650	560	7.17	3400	3462	29	191	0.69	-0.64	3.50	12.1	6.0
0	650	580	7.20	3468	3529	29	187	0.66	-0.62	3.45	12.2	6.2
0	650	600	7.22	3534	3593	29	184	0.64	-0.60	3.40	12.2	6.3

**Figure 6-66 (Sheet 2 of 21)**

# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	700	400	7.22	2938	2923	33	245	1.05	-0.97	4.17	12.2	5.1
0	700	420	7.25	2930	3012	33	237	1.00	-0.92	4.07	12.3	5.3
0	700	440	7.29	3019	3099	32	231	0.95	-0.87	3.98	12.3	5.5
0	700	460	7.33	3104	3182	32	224	0.90	-0.83	3.89	12.4	5.6
0	700	480	7.36	3187	3263	32	219	0.86	-0.80	3.81	12.4	5.8
0	700	500	7.39	3266	3340	31	214	0.82	-0.76	3.74	12.5	6.0
0	700	520	7.43	3342	3415	31	209	0.79	-0.74	3.67	12.6	6.1
0	700	540	7.46	3416	3487	31	204	0.76	-0.71	3.61	12.6	6.3
0	700	560	7.49	3487	3557	31	200	0.73	-0.68	3.56	12.7	6.4
0	700	580	7.52	3556	3624	31	197	0.71	-0.66	3.50	12.7	6.6
0	700	600	7.54	3622	3689	30	193	0.69	-0.64	3.46	12.8	6.7
0	750	400	7.52	2911	3006	35	255	1.11	-1.02	4.23	12.7	5.4
0	750	420	7.56	3005	3097	34	247	1.05	-0.97	4.12	12.8	5.6
0	750	440	7.59	3095	3185	34	240	1.00	-0.92	4.03	12.8	5.8
0	750	460	7.63	3182	3269	34	234	0.95	-0.88	3.94	12.9	6.0
0	750	480	7.67	3265	3350	33	228	0.91	-0.84	3.87	13.0	6.2
0	750	500	7.70	3345	3428	33	223	0.87	-0.81	3.80	13.0	6.3
0	750	520	7.73	3423	3504	33	218	0.84	-0.78	3.73	13.1	6.5
0	750	540	7.77	3497	3577	32	213	0.81	-0.75	3.67	13.1	6.6
0	750	560	7.80	3569	3647	32	209	0.78	-0.73	3.61	13.2	6.8
0	750	580	7.83	3638	3715	32	205	0.75	-0.70	3.56	13.2	7.0
0	750	600	7.86	3705	3781	32	202	0.73	-0.68	3.51	13.3	7.1
0	800	400	7.81	2981	3087	36	265	1.17	-1.08	4.28	13.2	5.7
0	800	420	7.85	3076	3178	36	257	1.11	-1.02	4.17	13.3	5.9
0	800	440	7.89	3167	3267	36	250	1.05	-0.97	4.08	13.3	6.1
0	800	460	7.93	3255	3352	35	244	1.00	-0.93	4.00	13.4	6.3
0	800	480	7.96	3339	3434	35	238	0.96	-0.89	3.92	13.5	6.5
0	800	500	8.00	3420	3513	35	232	0.92	-0.85	3.85	13.5	6.7
0	800	520	8.03	3498	3589	34	227	0.88	-0.82	3.78	13.6	6.8
0	800	540	8.07	3574	3662	34	222	0.85	-0.79	3.72	13.6	7.0
0	800	560	8.10	3646	3733	34	218	0.82	-0.77	3.67	13.7	7.2
0	800	580	8.13	3716	3802	34	214	0.80	-0.74	3.61	13.7	7.3
0	800	600	8.16	3784	3868	33	210	0.77	-0.72	3.56	13.8	7.5
0	850	400	8.10	3047	3164	38	275	1.22	-1.13	4.32	13.7	6.1
0	850	420	8.14	3144	3256	37	267	1.16	-1.07	4.22	13.8	6.3
0	850	440	8.18	3236	3346	37	259	1.10	-1.02	4.13	13.8	6.5
0	850	460	8.22	3324	3431	37	253	1.05	-0.97	4.05	13.9	6.7
0	850	480	8.25	3410	3514	36	247	1.01	-0.93	3.97	14.0	6.8
0	850	500	8.29	3492	3594	36	241	0.97	-0.90	3.90	14.0	7.0
0	850	520	8.33	3570	3670	36	236	0.93	-0.86	3.83	14.1	7.2
0	850	540	8.36	3646	3744	35	231	0.90	-0.83	3.77	14.1	7.4
0	850	560	8.39	3720	3816	35	227	0.87	-0.81	3.72	14.2	7.5
0	850	580	8.42	3790	3884	35	223	0.84	-0.78	3.66	14.2	7.7
0	850	600	8.45	3858	3951	35	219	0.81	-0.76	3.61	14.3	7.9
0	900	400	8.38	3111	3238	39	284	1.28	-1.18	4.37	14.2	6.4
0	900	420	8.42	3208	3332	39	276	1.21	-1.12	4.27	14.2	6.6
0	900	440	8.46	3301	3421	38	269	1.16	-1.07	4.18	14.3	6.8
0	900	460	8.50	3391	3508	38	262	1.10	-1.02	4.09	14.4	7.0
0	900	480	8.54	3477	3591	38	256	1.06	-0.98	4.02	14.4	7.2
0	900	500	8.57	3559	3671	37	250	1.02	-0.94	3.95	14.5	7.4
0	900	520	8.61	3639	3748	37	245	0.98	-0.91	3.88	14.5	7.6
0	900	540	8.64	3715	3823	37	240	0.94	-0.88	3.82	14.6	7.7
0	900	560	8.68	3789	3895	37	235	0.91	-0.85	3.76	14.7	7.9
0	900	580	8.71	3860	3964	37	231	0.88	-0.82	3.71	14.7	8.1
0	900	600	8.74	3929	4031	36	227	0.86	-0.80	3.66	14.8	8.2
0	950	400	8.65	3171	3310	41	294	1.34	-1.23	4.41	14.6	6.7
0	950	420	8.69	3269	3404	40	285	1.27	-1.17	4.31	14.7	6.9
0	950	440	8.73	3363	3495	40	278	1.21	-1.11	4.22	14.8	7.1
0	950	460	8.77	3454	3582	39	271	1.15	-1.07	4.14	14.8	7.3
0	950	480	8.81	3540	3666	39	265	1.11	-1.02	4.06	14.9	7.5
0	950	500	8.85	3624	3746	39	259	1.06	-0.98	3.99	15.0	7.7
0	950	520	8.89	3704	3824	38	253	1.02	-0.95	3.93	15.0	7.9
0	950	540	8.92	3781	3899	38	248	0.99	-0.92	3.87	15.1	8.1
0	950	560	8.96	3856	3971	38	244	0.95	-0.89	3.81	15.1	8.2
0	950	580	8.99	3927	4041	38	239	0.93	-0.86	3.76	15.2	8.4
0	950	600	9.02	3996	4108	38	235	0.90	-0.84	3.71	15.2	8.6

Figure 6-66 (Sheet 3 of 21)

## Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
5	300	400	3.02	1525	1554	17	111	0.75	-0.71	3.28	5.1	1.3
5	300	420	2.99	1569	1598	16	106	0.70	-0.67	3.16	5.1	1.3
5	300	440	2.96	1611	1639	15	101	0.66	-0.63	3.05	5.0	1.3
5	300	460	2.94	1652	1679	15	96	0.62	-0.60	2.95	5.0	1.4
5	300	480	2.91	1691	1717	15	92	0.59	-0.57	2.86	4.9	1.4
5	300	500	2.89	1723	1754	15	88	0.56	-0.54	2.78	4.9	1.4
5	300	520	2.86	1763	1789	14	85	0.53	-0.51	2.70	4.8	1.4
5	300	540	2.84	1798	1823	14	81	0.51	-0.49	2.63	4.8	1.5
5	300	560	2.82	1831	1855	14	78	0.49	-0.47	2.56	4.8	1.5
5	300	580	2.79	1863	1887	13	75	0.47	-0.45	2.50	4.7	1.5
5	300	600	2.77	1893	1917	13	73	0.45	-0.43	2.44	4.7	1.5
5	400	400	3.90	1814	1858	20	133	0.88	-0.83	3.45	6.4	1.9
5	400	420	3.77	1868	1910	20	127	0.82	-0.78	3.34	6.4	1.9
5	400	440	3.75	1919	1960	19	122	0.78	-0.74	3.23	6.3	2.0
5	400	460	3.73	1963	2003	19	116	0.74	-0.70	3.14	6.3	2.0
5	400	480	3.70	2015	2055	18	112	0.70	-0.66	3.05	6.3	2.0
5	400	500	3.68	2061	2099	18	107	0.66	-0.63	2.96	6.2	2.1
5	400	520	3.66	2104	2142	18	103	0.63	-0.61	2.89	6.2	2.1
5	400	540	3.64	2146	2183	17	100	0.61	-0.58	2.82	6.2	2.2
5	400	560	3.62	2187	2223	17	96	0.58	-0.56	2.75	6.1	2.2
5	400	580	3.60	2226	2261	17	93	0.56	-0.53	2.69	6.1	2.2
5	400	600	3.58	2263	2299	16	90	0.54	-0.52	2.63	6.1	2.3
5	500	400	4.52	2056	2116	24	155	1.00	-0.94	3.61	7.6	2.5
5	500	420	4.49	2117	2175	23	148	0.94	-0.89	3.49	7.6	2.5
5	500	440	4.47	2175	2232	23	142	0.89	-0.84	3.39	7.6	2.6
5	500	460	4.46	2231	2287	22	136	0.84	-0.80	3.29	7.5	2.7
5	500	480	4.44	2285	2339	22	131	0.80	-0.76	3.20	7.5	2.7
5	500	500	4.42	2337	2390	21	126	0.76	-0.73	3.12	7.5	2.8
5	500	520	4.40	2387	2438	21	122	0.73	-0.70	3.05	7.4	2.8
5	500	540	4.38	2434	2485	20	118	0.70	-0.67	2.98	7.4	2.9
5	500	560	4.37	2481	2531	20	114	0.67	-0.64	2.91	7.4	2.9
5	500	580	4.35	2525	2574	20	111	0.65	-0.62	2.85	7.3	3.0
5	500	600	4.33	2568	2616	19	107	0.62	-0.60	2.80	7.3	3.0
5	600	400	5.18	2264	2342	27	175	1.12	-1.05	3.74	8.8	3.1
5	600	420	5.17	2330	2406	26	168	1.05	-0.99	3.63	8.7	3.2
5	600	440	5.15	2395	2469	26	161	1.00	-0.94	3.53	8.7	3.2
5	600	460	5.13	2456	2528	25	155	0.95	-0.89	3.43	8.7	3.3
5	600	480	5.12	2515	2586	25	150	0.90	-0.85	3.34	8.7	3.4
5	600	500	5.10	2572	2641	24	145	0.86	-0.82	3.26	8.6	3.5
5	600	520	5.09	2627	2694	24	140	0.83	-0.78	3.19	8.6	3.5
5	600	540	5.07	2679	2746	23	135	0.79	-0.75	3.12	8.6	3.6
5	600	560	5.06	2730	2795	23	131	0.76	-0.72	3.06	8.6	3.7
5	600	580	5.05	2779	2843	23	128	0.73	-0.70	3.00	8.5	3.7
5	600	600	5.03	2826	2889	22	124	0.71	-0.67	2.94	8.5	3.8
5	700	400	5.81	2445	2544	30	195	1.23	-1.15	3.86	9.8	3.7
5	700	420	5.80	2517	2613	29	187	1.16	-1.09	3.75	9.8	3.8
5	700	440	5.79	2586	2679	29	180	1.10	-1.04	3.65	9.8	3.9
5	700	460	5.77	2652	2743	28	173	1.05	-0.99	3.56	9.8	4.0
5	700	480	5.76	2716	2804	28	168	1.00	-0.94	3.47	9.7	4.1
5	700	500	5.75	2777	2864	27	162	0.96	-0.91	3.39	9.7	4.1
5	700	520	5.74	2835	2920	27	157	0.92	-0.87	3.32	9.7	4.2
5	700	540	5.72	2892	2975	26	153	0.88	-0.84	3.25	9.7	4.3
5	700	560	5.71	2946	3028	26	148	0.85	-0.81	3.19	9.7	4.4
5	700	580	5.70	2999	3079	26	144	0.82	-0.78	3.13	9.6	4.4
5	700	600	5.69	3049	3129	25	141	0.79	-0.75	3.07	9.6	4.5
5	800	400	6.41	2607	2727	33	213	1.34	-1.26	3.97	10.8	4.3
5	800	420	6.40	2683	2800	32	205	1.27	-1.19	3.86	10.8	4.4
5	800	440	6.39	2756	2870	32	198	1.21	-1.13	3.76	10.8	4.5
5	800	460	6.38	2826	2937	31	191	1.15	-1.08	3.67	10.8	4.6
5	800	480	6.37	2893	3002	31	185	1.10	-1.03	3.58	10.8	4.7
5	800	500	6.36	2953	3064	30	179	1.05	-0.99	3.51	10.7	4.8
5	800	520	6.35	3020	3124	30	174	1.01	-0.95	3.43	10.7	4.9
5	800	540	6.34	3079	3181	29	169	0.97	-0.92	3.37	10.7	5.0
5	800	560	6.33	3137	3237	29	165	0.94	-0.89	3.31	10.7	5.1
5	800	580	6.32	3192	3291	29	160	0.91	-0.86	3.25	10.7	5.2
5	800	600	6.31	3245	3342	28	157	0.88	-0.83	3.19	10.7	5.2

**Figure 6-66 (Sheet 4 of 21)**

# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
deg	ft	kn	sec	ft	ft	deg	mil	HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
5	900	400	6.97	2753	2896	36	232					
5	900	420	6.97	2932	2972	35	223	1.45	-1.36	4.07	11.8	4.9
5	900	440	6.96	2909	3045	34	215	1.38	-1.29	3.96	11.8	5.0
5	900	460	6.95	2982	3115	34	208	1.31	-1.23	3.86	11.8	5.1
5	900	480	6.95	3052	3182	33	202	1.25	-1.17	3.77	11.8	5.2
5	900	500	6.94	3111	3247	33	196	1.20	-1.12	3.69	11.7	5.4
5	900	520	6.93	3184	3309	33	190	1.15	-1.08	3.61	11.7	5.5
5	900	540	6.93	3247	3369	32	185	1.10	-1.04	3.54	11.7	5.6
5	900	560	6.92	3307	3427	32	181	1.06	-1.00	3.47	11.7	5.7
5	900	580	6.91	3364	3483	31	176	1.02	-0.97	3.41	11.7	5.8
5	900	600	6.91	3420	3536	31	172	0.99	-0.93	3.35	11.7	5.9
								0.96	-0.91	3.30	11.7	6.0
5	1000	400	7.52	2885	3053	33	249					
5	1000	420	7.51	2969	3132	33	240	1.56	-1.45	4.16	12.7	5.5
5	1000	440	7.51	3047	3207	37	232	1.48	-1.38	4.05	12.7	5.6
5	1000	460	7.50	3123	3279	37	225	1.41	-1.32	3.96	12.7	5.7
5	1000	480	7.50	3196	3349	36	218	1.35	-1.26	3.87	12.7	5.9
5	1000	500	7.50	3266	3416	36	212	1.29	-1.21	3.78	12.7	6.0
5	1000	520	7.49	3333	3480	35	206	1.24	-1.16	3.71	12.7	6.1
5	1000	540	7.49	3398	3542	35	201	1.19	-1.12	3.64	12.7	6.2
5	1000	560	7.48	3460	3602	34	196	1.15	-1.08	3.57	12.7	6.3
5	1000	580	7.48	3520	3659	34	192	1.11	-1.04	3.51	12.6	6.4
5	1000	600	7.48	3578	3715	34	187	1.07	-1.01	3.45	12.6	6.5
								1.04	-0.98	3.40	12.6	6.6
5	1100	400	8.04	3005	3201	41	266					
5	1100	420	8.04	3092	3282	40	257	1.66	-1.55	4.24	13.6	6.0
5	1100	440	8.04	3174	3359	40	249	1.58	-1.47	4.14	13.6	6.2
5	1100	460	8.03	3252	3433	39	241	1.51	-1.41	4.04	13.6	6.3
5	1100	480	8.03	3329	3505	39	234	1.44	-1.35	3.95	13.6	6.5
5	1100	500	8.03	3400	3573	38	228	1.38	-1.29	3.87	13.6	6.6
5	1100	520	8.03	3469	3639	38	222	1.33	-1.24	3.80	13.6	6.7
5	1100	540	8.03	3536	3703	37	217	1.28	-1.20	3.73	13.6	6.9
5	1100	560	8.02	3600	3764	37	211	1.23	-1.16	3.66	13.6	7.0
5	1100	580	8.02	3661	3823	37	207	1.19	-1.12	3.60	13.6	7.1
5	1100	600	8.02	3721	3880	36	202	1.16	-1.09	3.55	13.6	7.2
								1.12	-1.05	3.49	13.6	7.3
5	1200	400	8.54	3118	3341	43	283					
5	1200	420	8.55	3206	3423	43	273	1.76	-1.64	4.32	14.4	6.6
5	1200	440	8.55	3290	3502	42	265	1.68	-1.56	4.22	14.4	6.8
5	1200	460	8.55	3371	3578	41	257	1.60	-1.49	4.12	14.4	6.9
5	1200	480	8.55	3448	3651	41	250	1.53	-1.43	4.04	14.4	7.1
5	1200	500	8.55	3523	3721	41	243	1.47	-1.38	3.96	14.4	7.2
5	1200	520	8.55	3594	3789	40	237	1.42	-1.32	3.88	14.4	7.4
5	1200	540	8.55	3662	3854	40	232	1.37	-1.28	3.81	14.4	7.5
5	1200	560	8.55	3728	3916	39	226	1.32	-1.24	3.75	14.4	7.6
5	1200	580	8.55	3791	3977	39	221	1.28	-1.20	3.69	14.4	7.8
5	1200	600	8.55	3852	4035	39	217	1.24	-1.16	3.63	14.4	7.9
								1.20	-1.13	3.58	14.4	8.0
5	1300	400	9.03	3221	3474	45	299					
5	1300	420	9.04	3312	3558	45	299	1.86	-1.73	4.39	15.3	7.2
5	1300	440	9.04	3393	3639	44	291	1.78	-1.65	4.29	15.3	7.4
5	1300	460	9.04	3481	3716	44	281	1.70	-1.58	4.20	15.3	7.5
5	1300	480	9.04	3560	3790	43	273	1.63	-1.51	4.11	15.3	7.7
5	1300	500	9.05	3636	3862	43	265	1.56	-1.46	4.03	15.3	7.9
5	1300	520	9.05	3709	3930	42	258	1.50	-1.40	3.96	15.3	8.0
5	1300	540	9.05	3779	3997	42	252	1.45	-1.36	3.89	15.3	8.1
5	1300	560	9.05	3846	4060	42	246	1.40	-1.31	3.83	15.3	8.3
5	1300	580	9.05	3911	4121	41	241	1.36	-1.27	3.77	15.3	8.4
5	1300	600	9.05	3973	4181	41	236	1.32	-1.23	3.71	15.3	8.5
								1.29	-1.20	3.66	15.3	8.7
5	1400	400	9.51	3313	3601	47	315					
5	1400	420	9.51	3411	3687	47	305	1.96	-1.82	4.46	16.1	7.7
5	1400	440	9.52	3499	3769	46	296	1.87	-1.74	4.36	16.1	7.9
5	1400	460	9.52	3584	3847	46	288	1.79	-1.66	4.27	16.1	8.1
5	1400	480	9.53	3665	3923	45	280	1.72	-1.60	4.18	16.1	8.3
5	1400	500	9.53	3742	3995	45	273	1.65	-1.54	4.10	16.1	8.4
5	1400	520	9.53	3816	4065	45	266	1.59	-1.48	4.03	16.1	8.6
5	1400	540	9.54	3888	4132	44	260	1.54	-1.43	3.96	16.1	8.7
5	1400	560	9.54	3956	4197	44	255	1.49	-1.39	3.90	16.1	8.9
5	1400	580	9.54	4022	4259	44	250	1.44	-1.35	3.84	16.1	9.0
5	1400	600	9.54	4086	4319	43	245	1.40	-1.31	3.79	16.1	9.2
								1.36	-1.27	3.73	16.1	9.3

Figure 6-66 (Sheet 5 of 21)

## Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
5	1500	400	9.37	3403	3724	49	330	2.06	-1.90	4.52	16.9	8.3
5	1500	420	9.38	3503	3811	49	320	1.96	-1.82	4.42	16.9	8.5
5	1500	440	9.39	3593	3894	48	311	1.88	-1.74	4.33	16.9	8.7
5	1500	460	9.39	3679	3973	48	302	1.80	-1.68	4.25	16.9	8.9
5	1500	480	10.00	3762	4050	47	294	1.74	-1.62	4.17	16.9	9.0
5	1500	500	10.00	3841	4123	47	287	1.67	-1.56	4.10	16.9	9.2
5	1500	520	10.01	3917	4194	47	281	1.62	-1.51	4.03	16.9	9.4
5	1500	540	10.01	3989	4262	46	274	1.57	-1.46	3.97	16.9	9.5
5	1500	560	10.02	4059	4327	46	269	1.52	-1.42	3.91	16.9	9.7
5	1500	580	10.02	4126	4390	46	263	1.47	-1.38	3.86	16.9	9.8
5	1500	600	10.02	4191	4451	45	258	1.43	-1.34	3.81	16.9	9.9
5	1600	400	10.42	3494	3843	51	345	2.15	-1.99	4.58	17.6	8.8
5	1600	420	10.43	3590	3930	51	334	2.05	-1.90	4.48	17.6	9.0
5	1600	440	10.44	3682	4014	50	325	1.97	-1.82	4.39	17.6	9.2
5	1600	460	10.45	3769	4095	50	316	1.89	-1.76	4.31	17.7	9.4
5	1600	480	10.46	3853	4172	49	309	1.82	-1.69	4.23	17.7	9.6
5	1600	500	10.46	3934	4247	49	301	1.76	-1.63	4.16	17.7	9.8
5	1600	520	10.47	4011	4318	49	294	1.70	-1.58	4.10	17.7	9.9
5	1600	540	10.47	4085	4387	48	288	1.65	-1.53	4.03	17.7	10.1
5	1600	560	10.48	4155	4453	48	282	1.60	-1.49	3.98	17.7	10.3
5	1600	580	10.48	4224	4516	48	277	1.55	-1.45	3.92	17.7	10.4
5	1600	600	10.49	4289	4578	47	272	1.51	-1.41	3.87	17.7	10.5
5	1700	400	10.86	3574	3958	53	359	2.24	-2.07	4.64	18.4	9.4
5	1700	420	10.87	3672	4046	52	349	2.14	-1.98	4.54	18.4	9.6
5	1700	440	10.88	3765	4131	52	339	2.05	-1.90	4.45	18.4	9.8
5	1700	460	10.89	3854	4213	51	330	1.97	-1.83	4.37	18.4	10.0
5	1700	480	10.90	3939	4291	51	322	1.90	-1.77	4.29	18.4	10.2
5	1700	500	10.91	4021	4366	51	315	1.84	-1.71	4.22	18.4	10.4
5	1700	520	10.92	4099	4438	50	308	1.78	-1.65	4.16	18.5	10.5
5	1700	540	10.93	4174	4507	50	302	1.72	-1.61	4.10	18.5	10.7
5	1700	560	10.93	4246	4574	50	296	1.67	-1.56	4.04	18.5	10.9
5	1700	580	10.94	4315	4638	49	290	1.63	-1.52	3.99	18.5	11.0
5	1700	600	10.94	4382	4700	49	285	1.58	-1.48	3.93	18.5	11.2
5	1800	400	11.30	3650	4070	54	373	2.33	-2.15	4.69	19.1	9.9
5	1800	420	11.31	3749	4159	54	363	2.23	-2.06	4.59	19.1	10.1
5	1800	440	11.32	3844	4245	54	353	2.14	-1.98	4.51	19.1	10.4
5	1800	460	11.33	3934	4327	53	344	2.06	-1.91	4.43	19.1	10.6
5	1800	480	11.34	4021	4405	53	336	1.98	-1.84	4.35	19.2	10.8
5	1800	500	11.35	4103	4481	52	328	1.92	-1.78	4.28	19.2	10.9
5	1800	520	11.36	4183	4554	52	321	1.86	-1.73	4.22	19.2	11.1
5	1800	540	11.37	4259	4623	52	315	1.80	-1.68	4.15	19.2	11.3
5	1800	560	11.37	4331	4691	52	309	1.75	-1.63	4.10	19.2	11.5
5	1800	580	11.38	4401	4755	51	303	1.70	-1.59	4.04	19.2	11.6
5	1800	600	11.39	4469	4818	51	298	1.66	-1.55	3.99	19.2	11.8
5	1900	400	11.72	3722	4179	56	387	2.41	-2.23	4.74	19.8	10.5
5	1900	420	11.73	3823	4269	55	376	2.31	-2.14	4.64	19.8	10.7
5	1900	440	11.75	3919	4355	55	367	2.22	-2.06	4.56	19.9	10.9
5	1900	460	11.76	4010	4438	55	357	2.14	-1.98	4.48	19.9	11.1
5	1900	480	11.77	4098	4517	54	349	2.06	-1.91	4.40	19.9	11.3
5	1900	500	11.78	4182	4593	54	341	2.00	-1.85	4.33	19.9	11.5
5	1900	520	11.79	4262	4666	54	334	1.93	-1.80	4.27	19.9	11.7
5	1900	540	11.80	4339	4736	53	328	1.88	-1.74	4.21	19.9	11.9
5	1900	560	11.81	4412	4804	53	321	1.82	-1.70	4.15	20.0	12.0
5	1900	580	11.82	4483	4869	53	316	1.78	-1.65	4.10	20.0	12.2
5	1900	600	11.82	4551	4932	53	310	1.73	-1.61	4.05	20.0	12.4
5	2000	400	12.14	3791	4286	57	401	2.49	-2.30	4.73	20.5	11.0
5	2000	420	12.15	3893	4376	57	390	2.39	-2.21	4.69	20.5	11.2
5	2000	440	12.16	3990	4463	57	380	2.30	-2.13	4.61	20.6	11.5
5	2000	460	12.18	4083	4546	56	371	2.22	-2.05	4.53	20.6	11.7
5	2000	480	12.19	4171	4626	56	362	2.14	-1.99	4.45	20.6	11.9
5	2000	500	12.20	4256	4702	56	354	2.07	-1.92	4.39	20.6	12.1
5	2000	520	12.21	4337	4776	55	347	2.01	-1.87	4.32	20.6	12.3
5	2000	540	12.22	4415	4847	55	340	1.95	-1.81	4.26	20.7	12.5
5	2000	560	12.23	4489	4915	55	334	1.90	-1.76	4.21	20.7	12.6
5	2000	580	12.24	4561	4980	54	328	1.85	-1.72	4.15	20.7	12.8
5	2000	600	12.25	4630	5043	54	322	1.80	-1.68	4.10	20.7	13.0

**Figure 6-66 (Sheet 6 of 21)**

**Ballistic Table — BDU-33 High Drag Bomb**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	300	400	2.14	1146	1185	18	86	0.90	-0.87	3.06	3.6	0.7
10	300	420	2.10	1169	1207	18	81	0.85	-0.82	2.93	3.5	0.7
10	300	440	2.05	1191	1228	17	77	0.80	-0.77	2.82	3.5	0.7
10	300	460	2.01	1211	1248	17	73	0.75	-0.73	2.72	3.4	0.7
10	300	480	1.96	1230	1266	16	69	0.72	-0.69	2.62	3.3	0.7
10	300	500	1.92	1249	1284	16	66	0.68	-0.66	2.53	3.3	0.7
10	300	520	1.89	1265	1300	16	63	0.65	-0.63	2.45	3.2	0.7
10	300	540	1.85	1281	1315	15	60	0.62	-0.60	2.37	3.1	0.7
10	300	560	1.81	1296	1330	15	57	0.59	-0.57	2.30	3.1	0.7
10	300	580	1.78	1310	1344	15	55	0.57	-0.55	2.24	3.0	0.7
10	300	600	1.74	1323	1356	15	52	0.54	-0.53	2.17	2.9	0.7
10	400	400	2.81	1422	1477	21	104	1.03	-0.98	3.21	4.7	1.1
10	400	420	2.76	1454	1508	20	93	0.97	-0.93	3.09	4.7	1.1
10	400	440	2.71	1493	1536	20	93	0.91	-0.87	2.98	4.6	1.2
10	400	460	2.66	1511	1563	19	88	0.86	-0.83	2.88	4.5	1.2
10	400	480	2.61	1537	1589	19	84	0.82	-0.79	2.78	4.4	1.2
10	400	500	2.57	1562	1613	18	80	0.78	-0.75	2.69	4.3	1.2
10	400	520	2.53	1586	1636	18	76	0.74	-0.72	2.61	4.3	1.2
10	400	540	2.49	1608	1657	18	73	0.71	-0.68	2.53	4.2	1.2
10	400	560	2.45	1629	1678	17	70	0.68	-0.66	2.46	4.1	1.2
10	400	580	2.41	1649	1697	17	67	0.65	-0.63	2.40	4.1	1.2
10	400	600	2.37	1668	1716	17	64	0.63	-0.61	2.33	4.0	1.2
10	500	400	3.45	1663	1737	23	121	1.15	-1.09	3.35	5.8	1.6
10	500	420	3.39	1702	1774	23	115	1.08	-1.03	3.23	5.7	1.6
10	500	440	3.34	1739	1809	22	109	1.02	-0.98	3.12	5.7	1.6
10	500	460	3.29	1774	1843	22	104	0.97	-0.93	3.02	5.6	1.7
10	500	480	3.25	1807	1875	21	99	0.92	-0.88	2.93	5.5	1.7
10	500	500	3.20	1838	1905	21	94	0.88	-0.84	2.84	5.4	1.7
10	500	520	3.16	1868	1934	20	90	0.84	-0.80	2.76	5.3	1.7
10	500	540	3.11	1896	1961	20	85	0.80	-0.77	2.68	5.3	1.7
10	500	560	3.07	1923	1987	19	83	0.77	-0.74	2.61	5.2	1.7
10	500	580	3.03	1949	2012	19	80	0.74	-0.71	2.55	5.1	1.7
10	500	600	2.99	1973	2035	19	76	0.71	-0.68	2.48	5.1	1.7
10	600	400	4.06	1876	1970	26	138	1.26	-1.20	3.48	6.9	2.1
10	600	420	4.01	1922	2013	25	131	1.19	-1.14	3.36	6.8	2.1
10	600	440	3.96	1965	2054	25	125	1.13	-1.08	3.25	6.7	2.2
10	600	460	3.91	2006	2094	24	119	1.07	-1.02	3.15	6.6	2.2
10	600	480	3.86	2045	2131	24	114	1.02	-0.97	3.06	6.5	2.2
10	600	500	3.81	2082	2167	23	109	0.97	-0.93	2.97	6.4	2.2
10	600	520	3.77	2117	2201	23	104	0.93	-0.89	2.89	6.4	2.2
10	600	540	3.73	2151	2233	22	100	0.89	-0.85	2.82	6.3	2.3
10	600	560	3.69	2183	2264	22	96	0.86	-0.82	2.75	6.2	2.3
10	600	580	3.64	2214	2294	21	93	0.82	-0.79	2.69	6.2	2.3
10	600	600	3.61	2243	2322	21	89	0.79	-0.76	2.62	6.1	2.3
10	700	400	4.65	2066	2181	29	155	1.38	-1.31	3.60	7.9	2.6
10	700	420	4.60	2117	2230	28	148	1.30	-1.24	3.48	7.8	2.6
10	700	440	4.55	2166	2277	27	141	1.23	-1.17	3.37	7.7	2.7
10	700	460	4.50	2213	2321	27	135	1.17	-1.12	3.27	7.6	2.7
10	700	480	4.45	2257	2363	26	129	1.12	-1.06	3.18	7.5	2.7
10	700	500	4.41	2299	2403	26	124	1.07	-1.02	3.10	7.4	2.8
10	700	520	4.36	2339	2442	25	119	1.02	-0.98	3.02	7.4	2.8
10	700	540	4.32	2378	2479	25	114	0.98	-0.94	2.95	7.3	2.8
10	700	560	4.28	2415	2514	24	110	0.94	-0.90	2.88	7.2	2.9
10	700	580	4.24	2450	2548	24	106	0.91	-0.87	2.81	7.2	2.9
10	700	600	4.20	2483	2580	23	103	0.88	-0.84	2.75	7.1	2.9
10	800	400	5.21	2237	2376	31	172	1.49	-1.41	3.71	8.8	3.1
10	800	420	5.16	2293	2429	31	164	1.41	-1.33	3.59	8.7	3.2
10	800	440	5.11	2347	2480	30	157	1.34	-1.27	3.48	8.6	3.2
10	800	460	5.07	2399	2529	29	150	1.27	-1.21	3.39	8.6	3.3
10	800	480	5.02	2448	2575	29	144	1.21	-1.15	3.30	8.5	3.3
10	800	500	4.98	2494	2619	28	138	1.16	-1.11	3.21	8.4	3.4
10	800	520	4.94	2539	2662	28	133	1.11	-1.06	3.13	8.3	3.4
10	800	540	4.90	2581	2703	27	128	1.07	-1.02	3.06	8.3	3.4
10	800	560	4.86	2622	2741	27	124	1.03	-0.98	2.99	8.2	3.5
10	800	580	4.82	2661	2779	26	120	0.99	-0.95	2.93	8.1	3.5
10	800	600	4.78	2699	2815	26	116	0.96	-0.92	2.87	8.1	3.5

**Figure 6-66 (Sheet 7 of 21)**

## Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	900	400	5.76	2392	2556	34	188	1.60	-1.51	3.81	9.7	3.7
10	900	420	5.71	2453	2613	33	180	1.51	-1.43	3.69	9.6	3.7
10	900	440	5.66	2511	2668	32	172	1.44	-1.36	3.59	9.6	3.8
10	900	460	5.62	2567	2720	32	165	1.37	-1.30	3.49	9.5	3.8
10	900	480	5.58	2620	2770	31	159	1.31	-1.24	3.40	9.4	3.9
10	900	500	5.54	2671	2818	30	153	1.25	-1.19	3.32	9.4	3.9
10	900	520	5.49	2719	2864	30	148	1.20	-1.14	3.24	9.3	4.0
10	900	540	5.46	2765	2908	29	142	1.16	-1.10	3.17	9.2	4.0
10	900	560	5.42	2810	2950	29	138	1.12	-1.06	3.10	9.2	4.1
10	900	580	5.38	2852	2991	29	133	1.08	-1.03	3.04	9.1	4.1
10	900	600	5.34	2893	3030	28	129	1.04	-0.99	2.98	9.0	4.1
10	1000	400	6.29	2533	2724	35	204	1.70	-1.60	3.90	10.6	4.2
10	1000	420	6.24	2599	2785	35	196	1.61	-1.52	3.79	10.5	4.3
10	1000	440	6.20	2661	2843	35	188	1.54	-1.45	3.68	10.5	4.3
10	1000	460	6.15	2721	2899	34	180	1.47	-1.39	3.59	10.4	4.4
10	1000	480	6.11	2777	2952	33	174	1.40	-1.33	3.50	10.3	4.5
10	1000	500	6.07	2831	3003	33	167	1.34	-1.27	3.42	10.3	4.5
10	1000	520	6.03	2883	3052	32	162	1.29	-1.22	3.34	10.2	4.6
10	1000	540	6.00	2933	3098	32	156	1.24	-1.18	3.27	10.1	4.6
10	1000	560	5.96	2980	3143	31	151	1.20	-1.14	3.20	10.1	4.7
10	1000	580	5.93	3026	3187	31	147	1.16	-1.10	3.14	10.0	4.7
10	1000	600	5.89	3069	3228	30	143	1.12	-1.07	3.08	10.0	4.8
10	1100	400	6.80	2664	2832	39	220	1.80	-1.70	3.98	11.5	4.7
10	1100	420	6.75	2733	2946	38	211	1.71	-1.61	3.87	11.4	4.8
10	1100	440	6.71	2799	3007	37	203	1.63	-1.54	3.77	11.3	4.9
10	1100	460	6.67	2861	3066	36	195	1.56	-1.47	3.68	11.3	5.0
10	1100	480	6.63	2921	3122	35	188	1.49	-1.41	3.59	11.2	5.0
10	1100	500	6.59	2979	3175	35	182	1.43	-1.36	3.51	11.1	5.1
10	1100	520	6.56	3033	3227	35	176	1.38	-1.30	3.43	11.1	5.2
10	1100	540	6.52	3086	3276	34	170	1.33	-1.26	3.36	11.0	5.2
10	1100	560	6.49	3135	3323	34	165	1.28	-1.22	3.30	11.0	5.3
10	1100	580	6.45	3184	3369	33	160	1.24	-1.18	3.24	10.9	5.3
10	1100	600	6.42	3231	3413	33	156	1.20	-1.14	3.18	10.9	5.4
10	1200	400	7.29	2784	3032	41	235	1.90	-1.79	4.06	12.3	5.3
10	1200	420	7.25	2857	3098	40	226	1.81	-1.70	3.95	12.3	5.3
10	1200	440	7.21	2926	3162	39	217	1.73	-1.62	3.85	12.2	5.4
10	1200	460	7.17	2991	3223	39	209	1.65	-1.56	3.76	12.1	5.5
10	1200	480	7.14	3054	3281	38	202	1.58	-1.49	3.68	12.1	5.6
10	1200	500	7.10	3114	3337	37	196	1.52	-1.44	3.60	12.0	5.7
10	1200	520	7.07	3172	3391	37	189	1.46	-1.38	3.52	11.9	5.7
10	1200	540	7.03	3227	3443	36	184	1.41	-1.34	3.45	11.9	5.8
10	1200	560	7.00	3279	3492	36	178	1.36	-1.29	3.39	11.8	5.9
10	1200	580	6.97	3330	3540	36	173	1.32	-1.25	3.33	11.8	5.9
10	1200	600	6.94	3379	3585	35	169	1.28	-1.21	3.27	11.7	6.0
10	1300	400	7.78	2896	3174	43	250	2.00	-1.88	4.14	13.1	5.8
10	1300	420	7.74	2971	3243	42	240	1.91	-1.79	4.03	13.1	5.9
10	1300	440	7.70	3043	3309	41	232	1.82	-1.71	3.93	13.0	6.0
10	1300	460	7.66	3112	3372	41	224	1.74	-1.64	3.84	13.0	6.1
10	1300	480	7.63	3177	3433	40	216	1.67	-1.57	3.76	12.9	6.2
10	1300	500	7.60	3240	3491	40	209	1.61	-1.51	3.68	12.8	6.3
10	1300	520	7.56	3300	3547	39	203	1.55	-1.46	3.60	12.8	6.3
10	1300	540	7.53	3357	3600	39	197	1.49	-1.41	3.53	12.7	6.4
10	1300	560	7.50	3412	3651	38	192	1.45	-1.37	3.47	12.7	6.5
10	1300	580	7.47	3465	3701	38	186	1.40	-1.32	3.41	12.6	6.6
10	1300	600	7.44	3515	3748	37	182	1.36	-1.28	3.35	12.6	6.6
10	1400	400	8.25	3000	3311	45	265	2.10	-1.96	4.21	13.9	6.3
10	1400	420	8.21	3079	3382	44	255	2.00	-1.87	4.10	13.9	6.4
10	1400	440	8.17	3153	3450	44	246	1.91	-1.79	4.00	13.8	6.5
10	1400	460	8.14	3224	3515	43	238	1.83	-1.72	3.91	13.8	6.6
10	1400	480	8.11	3292	3577	42	230	1.76	-1.65	3.83	13.7	6.7
10	1400	500	8.08	3357	3637	42	223	1.69	-1.59	3.75	13.6	6.8
10	1400	520	8.04	3419	3694	41	216	1.63	-1.54	3.68	13.6	6.9
10	1400	540	8.01	3478	3749	41	210	1.58	-1.49	3.61	13.5	7.0
10	1400	560	7.99	3535	3802	40	205	1.52	-1.44	3.55	13.5	7.1
10	1400	580	7.96	3590	3853	40	199	1.48	-1.40	3.49	13.4	7.2
10	1400	600	7.93	3642	3902	39	194	1.43	-1.36	3.43	13.4	7.2

Figure 6-66 (Sheet 8 of 21)



# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	1500	400	8.71	3093	3442	47	279	2.19	-2.05	4.27	14.7	6.8
10	1500	420	8.67	3179	3515	46	269	2.09	-1.96	4.17	14.7	7.0
10	1500	440	8.64	3255	3584	45	260	2.00	-1.87	4.07	14.6	7.1
10	1500	460	8.61	3323	3651	45	251	1.92	-1.80	3.98	14.5	7.2
10	1500	480	8.58	3393	3715	44	243	1.84	-1.73	3.90	14.5	7.3
10	1500	500	8.55	3466	3776	44	236	1.77	-1.67	3.82	14.4	7.4
10	1500	520	8.52	3530	3835	43	229	1.71	-1.61	3.75	14.4	7.5
10	1500	540	8.49	3591	3892	43	223	1.66	-1.56	3.69	14.3	7.6
10	1500	560	8.46	3650	3946	42	217	1.60	-1.51	3.62	14.3	7.7
10	1500	580	8.43	3706	3998	42	212	1.55	-1.47	3.56	14.3	7.8
10	1500	600	8.41	3760	4049	42	207	1.51	-1.42	3.51	14.2	7.8
10	1600	400	9.15	3190	3569	49	293	2.28	-2.13	4.33	15.5	7.4
10	1600	420	9.12	3273	3643	48	283	2.18	-2.04	4.23	15.4	7.5
10	1600	440	9.09	3352	3714	47	273	2.08	-1.95	4.14	15.4	7.6
10	1600	460	9.06	3427	3782	47	265	2.00	-1.88	4.05	15.3	7.7
10	1600	480	9.03	3499	3848	46	257	1.92	-1.81	3.97	15.3	7.9
10	1600	500	9.00	3568	3910	46	249	1.86	-1.74	3.89	15.2	8.0
10	1600	520	8.98	3634	3970	45	242	1.79	-1.68	3.82	15.2	8.1
10	1600	540	8.95	3697	4028	45	236	1.73	-1.63	3.75	15.1	8.2
10	1600	560	8.92	3757	4084	44	230	1.68	-1.58	3.69	15.1	8.3
10	1600	580	8.90	3815	4137	44	225	1.63	-1.54	3.63	15.0	8.4
10	1600	600	8.87	3871	4189	44	219	1.58	-1.49	3.58	15.0	8.4
10	1700	400	9.59	3276	3691	50	307	2.37	-2.21	4.39	16.2	7.9
10	1700	420	9.56	3361	3767	50	296	2.26	-2.11	4.29	16.2	8.0
10	1700	440	9.54	3442	3839	49	287	2.17	-2.03	4.20	16.1	8.2
10	1700	460	9.51	3520	3909	49	278	2.08	-1.95	4.11	16.1	8.3
10	1700	480	9.48	3594	3975	48	270	2.01	-1.89	4.03	16.0	8.4
10	1700	500	9.45	3664	4039	48	262	1.93	-1.82	3.95	16.0	8.5
10	1700	520	9.43	3732	4101	47	255	1.87	-1.76	3.88	15.9	8.6
10	1700	540	9.40	3796	4159	47	249	1.81	-1.70	3.82	15.9	8.7
10	1700	560	9.38	3858	4216	46	242	1.76	-1.65	3.76	15.8	8.8
10	1700	580	9.35	3918	4271	46	237	1.70	-1.60	3.70	15.8	8.9
10	1700	600	9.33	3975	4323	45	232	1.66	-1.56	3.65	15.8	9.0
10	1800	400	10.03	3358	3810	52	320	2.45	-2.29	4.45	16.9	8.4
10	1800	420	10.00	3445	3887	51	309	2.35	-2.19	4.35	16.9	8.6
10	1800	440	9.97	3528	3961	51	300	2.25	-2.10	4.25	16.8	8.7
10	1800	460	9.94	3607	4031	50	291	2.16	-2.03	4.17	16.8	8.8
10	1800	480	9.92	3683	4099	50	282	2.09	-1.95	4.09	16.8	9.0
10	1800	500	9.89	3755	4164	49	275	2.01	-1.89	4.01	16.7	9.1
10	1800	520	9.87	3824	4226	49	268	1.95	-1.83	3.95	16.7	9.2
10	1800	540	9.84	3890	4286	48	261	1.89	-1.77	3.88	16.6	9.3
10	1800	560	9.82	3953	4344	48	255	1.83	-1.72	3.82	16.6	9.4
10	1800	580	9.80	4014	4399	48	249	1.78	-1.67	3.76	16.6	9.5
10	1800	600	9.78	4072	4452	47	244	1.73	-1.63	3.71	16.5	9.6
10	1900	400	10.45	3435	3926	54	333	2.54	-2.37	4.50	17.7	8.9
10	1900	420	10.42	3524	4004	53	322	2.43	-2.27	4.40	17.6	9.1
10	1900	440	10.40	3609	4079	52	312	2.33	-2.18	4.31	17.6	9.2
10	1900	460	10.37	3690	4150	52	303	2.24	-2.10	4.22	17.5	9.4
10	1900	480	10.35	3767	4219	51	295	2.16	-2.02	4.14	17.5	9.5
10	1900	500	10.32	3841	4285	51	287	2.09	-1.96	4.07	17.4	9.6
10	1900	520	10.30	3911	4348	51	280	2.02	-1.90	4.00	17.4	9.8
10	1900	540	10.28	3978	4409	50	273	1.96	-1.84	3.94	17.4	9.9
10	1900	560	10.26	4043	4467	50	267	1.90	-1.79	3.88	17.3	10.0
10	1900	580	10.24	4105	4523	49	261	1.85	-1.74	3.82	17.3	10.1
10	1900	600	10.21	4165	4578	49	255	1.80	-1.69	3.77	17.3	10.2
10	2000	400	10.87	3509	4039	55	346	2.62	-2.44	4.55	18.4	9.5
10	2000	420	10.84	3600	4118	55	335	2.51	-2.34	4.45	18.3	9.6
10	2000	440	10.82	3686	4194	54	325	2.41	-2.25	4.36	18.3	9.8
10	2000	460	10.79	3768	4266	53	316	2.32	-2.17	4.28	18.2	9.9
10	2000	480	10.77	3847	4336	53	307	2.24	-2.09	4.20	18.2	10.1
10	2000	500	10.75	3922	4402	53	299	2.17	-2.03	4.13	18.2	10.2
10	2000	520	10.73	3994	4466	52	292	2.10	-1.96	4.06	18.1	10.3
10	2000	540	10.71	4062	4528	52	285	2.03	-1.91	4.00	18.1	10.5
10	2000	560	10.68	4128	4587	51	279	1.98	-1.85	3.94	18.1	10.6
10	2000	580	10.66	4191	4644	51	273	1.92	-1.80	3.88	18.0	10.7
10	2000	600	10.64	4252	4699	51	267	1.87	-1.76	3.83	18.0	10.8

Figure 6-66 (Sheet 9 of 21)

# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil					
15	300	400	1.61	881	931	21	72	1.06	-1.03	2.91	2.7	0.4
15	300	420	1.56	894	943	21	68	0.99	-0.97	2.79	2.6	0.4
15	300	440	1.51	905	954	20	64	0.94	-0.91	2.67	2.6	0.4
15	300	460	1.47	916	964	20	61	0.89	-0.87	2.57	2.5	0.4
15	300	480	1.42	925	973	20	57	0.84	-0.82	2.47	2.4	0.4
15	300	500	1.38	934	981	19	54	0.80	-0.78	2.38	2.3	0.4
15	300	520	1.35	942	989	19	52	0.77	-0.75	2.30	2.3	0.4
15	300	540	1.31	950	996	19	49	0.73	-0.72	2.22	2.2	0.4
15	300	560	1.28	957	1003	19	47	0.70	-0.69	2.15	2.2	0.4
15	300	580	1.25	964	1010	19	45	0.67	-0.66	2.08	2.1	0.4
15	300	600	1.22	970	1016	19	43	0.65	-0.63	2.02	2.1	0.4
15	400	400	2.15	1123	1192	23	95	1.17	-1.13	3.05	3.6	0.7
15	400	420	2.09	1141	1209	22	89	1.10	-1.07	2.92	3.5	0.7
15	400	440	2.04	1158	1225	22	75	1.04	-1.01	2.81	3.4	0.7
15	400	460	1.99	1174	1240	22	71	0.99	-0.96	2.70	3.4	0.7
15	400	480	1.93	1189	1254	21	67	0.94	-0.91	2.60	3.3	0.7
15	400	500	1.88	1201	1266	21	64	0.89	-0.87	2.51	3.2	0.7
15	400	520	1.84	1214	1278	20	61	0.85	-0.83	2.43	3.1	0.7
15	400	540	1.80	1225	1289	20	58	0.81	-0.79	2.35	3.0	0.7
15	400	560	1.75	1236	1299	20	55	0.78	-0.76	2.28	3.0	0.7
15	400	580	1.71	1246	1309	20	53	0.75	-0.73	2.21	2.9	0.7
15	400	600	1.68	1256	1318	19	51	0.72	-0.70	2.15	2.8	0.7
15	500	400	2.69	1344	1434	25	99	1.29	-1.24	3.17	4.5	1.1
15	500	420	2.62	1367	1456	24	93	1.21	-1.17	3.04	4.4	1.1
15	500	440	2.56	1390	1477	24	88	1.14	-1.10	2.93	4.3	1.1
15	500	460	2.50	1410	1496	23	83	1.08	-1.05	2.83	4.2	1.1
15	500	480	2.45	1430	1514	23	79	1.03	-1.00	2.73	4.1	1.1
15	500	500	2.39	1448	1531	22	75	0.98	-0.95	2.64	4.0	1.0
15	500	520	2.34	1464	1547	22	71	0.94	-0.91	2.56	4.0	1.0
15	500	540	2.29	1480	1562	22	68	0.90	-0.87	2.48	3.9	1.0
15	500	560	2.24	1495	1576	21	64	0.86	-0.83	2.41	3.8	1.0
15	500	580	2.20	1509	1590	21	62	0.83	-0.80	2.34	3.7	1.0
15	500	600	2.16	1522	1602	21	59	0.80	-0.77	2.27	3.6	1.0
15	600	400	3.22	1544	1657	27	113	1.40	-1.34	3.28	5.4	1.4
15	600	420	3.15	1574	1634	26	106	1.32	-1.26	3.16	5.3	1.4
15	600	440	3.09	1601	1710	26	100	1.25	-1.20	3.05	5.2	1.4
15	600	460	3.02	1627	1734	25	95	1.18	-1.14	2.94	5.1	1.4
15	600	480	2.96	1651	1757	25	90	1.13	-1.08	2.85	5.0	1.4
15	600	500	2.90	1674	1778	24	86	1.07	-1.03	2.76	4.9	1.4
15	600	520	2.85	1695	1798	24	82	1.03	-0.99	2.68	4.8	1.4
15	600	540	2.79	1715	1817	23	78	0.98	-0.95	2.60	4.7	1.4
15	600	560	2.74	1734	1835	23	74	0.94	-0.91	2.53	4.6	1.4
15	600	580	2.69	1752	1852	23	71	0.91	-0.88	2.46	4.6	1.4
15	600	600	2.65	1769	1868	22	68	0.87	-0.85	2.39	4.5	1.4
15	700	400	3.74	1728	1865	29	127	1.51	-1.44	3.39	6.3	1.9
15	700	420	3.67	1763	1927	28	120	1.42	-1.36	3.27	6.2	1.9
15	700	440	3.60	1796	1927	28	113	1.35	-1.29	3.16	6.1	1.9
15	700	460	3.54	1827	1956	27	107	1.28	-1.23	3.06	6.0	1.9
15	700	480	3.47	1855	1983	27	102	1.22	-1.17	2.96	5.9	1.9
15	700	500	3.41	1883	2009	26	97	1.16	-1.12	2.87	5.8	1.9
15	700	520	3.35	1909	2033	26	93	1.11	-1.07	2.79	5.7	1.9
15	700	540	3.30	1932	2055	25	89	1.07	-1.03	2.71	5.6	1.9
15	700	560	3.24	1955	2077	25	85	1.03	-0.99	2.64	5.5	1.9
15	700	580	3.19	1977	2097	24	81	0.99	-0.95	2.57	5.4	1.9
15	700	600	3.14	1997	2116	24	78	0.95	-0.92	2.51	5.3	1.9
15	800	400	4.26	1897	2059	31	141	1.62	-1.54	3.49	7.2	2.3
15	800	420	4.18	1937	2036	31	133	1.53	-1.46	3.37	7.1	2.3
15	800	440	4.11	1975	2130	30	126	1.45	-1.38	3.26	7.0	2.3
15	800	460	4.05	2010	2163	29	120	1.38	-1.32	3.16	6.8	2.3
15	800	480	3.98	2043	2194	29	114	1.31	-1.26	3.07	6.7	2.3
15	800	500	3.92	2075	2224	28	109	1.26	-1.20	2.98	6.6	2.3
15	800	520	3.86	2105	2251	28	104	1.20	-1.15	2.90	6.5	2.3
15	800	540	3.80	2133	2278	27	100	1.15	-1.11	2.82	6.4	2.3
15	800	560	3.74	2159	2303	27	96	1.11	-1.07	2.75	6.3	2.3
15	800	580	3.69	2185	2326	26	92	1.07	-1.03	2.68	6.2	2.3
15	800	600	3.64	2209	2349	26	88	1.03	-0.99	2.62	6.1	2.3

Figure 6-66 (Sheet 10 of 21)

**Ballistic Table — BDU-33 High Drag Bomb**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	900	400	4.76	2052	2241	33	155	1.72	-1.64	3.59	8.0	2.7
15	900	420	4.69	2097	2282	33	147	1.63	-1.55	3.47	7.9	2.7
15	900	440	4.62	2139	2321	32	139	1.55	-1.47	3.36	7.8	2.8
15	900	460	4.55	2179	2358	31	133	1.47	-1.41	3.26	7.7	2.8
15	900	480	4.48	2217	2392	31	127	1.41	-1.34	3.17	7.6	2.8
15	900	500	4.42	2252	2425	30	121	1.35	-1.29	3.08	7.5	2.8
15	900	520	4.36	2285	2457	29	116	1.29	-1.23	3.00	7.4	2.9
15	900	540	4.30	2313	2486	29	111	1.24	-1.19	2.92	7.3	2.8
15	900	560	4.24	2343	2514	28	107	1.19	-1.14	2.85	7.2	2.8
15	900	580	4.19	2377	2541	28	103	1.15	-1.10	2.78	7.1	2.8
15	900	600	4.13	2404	2567	28	99	1.11	-1.07	2.72	7.0	2.8
15	1000	400	5.25	2196	2413	36	163	1.82	-1.73	3.68	8.9	3.2
15	1000	420	5.18	2245	2458	35	160	1.73	-1.64	3.56	8.8	3.2
15	1000	440	5.11	2292	2500	34	152	1.64	-1.56	3.45	8.6	3.2
15	1000	460	5.04	2336	2541	33	145	1.57	-1.49	3.35	8.5	3.3
15	1000	480	4.97	2377	2579	33	139	1.50	-1.43	3.26	8.4	3.3
15	1000	500	4.91	2416	2615	32	133	1.43	-1.37	3.17	8.3	3.3
15	1000	520	4.85	2453	2649	31	128	1.38	-1.31	3.09	8.2	3.3
15	1000	540	4.79	2489	2682	31	123	1.32	-1.27	3.02	8.1	3.3
15	1000	560	4.73	2522	2713	30	119	1.27	-1.22	2.95	8.0	3.3
15	1000	580	4.68	2554	2743	30	114	1.23	-1.18	2.88	7.9	3.3
15	1000	600	4.62	2585	2772	30	110	1.19	-1.14	2.82	7.8	3.4
15	1100	400	5.74	2330	2576	38	182	1.93	-1.82	3.76	9.7	3.7
15	1100	420	5.66	2383	2625	37	173	1.83	-1.73	3.65	9.6	3.7
15	1100	440	5.59	2433	2670	36	166	1.74	-1.65	3.54	9.5	3.7
15	1100	460	5.52	2481	2714	35	158	1.66	-1.58	3.44	9.3	3.8
15	1100	480	5.46	2526	2755	35	152	1.59	-1.51	3.35	9.2	3.8
15	1100	500	5.40	2568	2794	34	145	1.52	-1.45	3.26	9.1	3.8
15	1100	520	5.33	2609	2831	33	140	1.46	-1.39	3.18	9.0	3.8
15	1100	540	5.28	2648	2867	33	134	1.41	-1.34	3.11	8.9	3.8
15	1100	560	5.22	2684	2901	32	129	1.36	-1.30	3.04	8.8	3.9
15	1100	580	5.16	2719	2933	32	125	1.31	-1.25	2.97	8.7	3.9
15	1100	600	5.11	2753	2964	31	121	1.27	-1.21	2.91	8.6	3.9
15	1200	400	6.21	2454	2732	40	196	2.02	-1.91	3.84	10.5	4.1
15	1200	420	6.14	2511	2783	39	187	1.92	-1.82	3.73	10.4	4.2
15	1200	440	6.07	2565	2832	38	178	1.83	-1.74	3.62	10.3	4.2
15	1200	460	6.00	2616	2878	37	171	1.75	-1.66	3.52	10.1	4.3
15	1200	480	5.94	2664	2922	37	164	1.68	-1.59	3.43	10.0	4.3
15	1200	500	5.87	2710	2964	36	157	1.61	-1.53	3.35	9.9	4.3
15	1200	520	5.81	2754	3004	35	152	1.55	-1.47	3.27	9.8	4.3
15	1200	540	5.75	2795	3042	35	146	1.49	-1.42	3.20	9.7	4.4
15	1200	560	5.70	2835	3078	34	141	1.44	-1.37	3.13	9.6	4.4
15	1200	580	5.64	2873	3113	34	136	1.39	-1.32	3.06	9.5	4.4
15	1200	600	5.59	2909	3146	33	132	1.34	-1.28	3.00	9.4	4.4
15	1300	400	6.67	2570	2980	42	209	2.12	-2.00	3.91	11.3	4.6
15	1300	420	6.60	2630	2934	41	200	2.02	-1.91	3.80	11.2	4.7
15	1300	440	6.53	2687	2985	40	191	1.92	-1.82	3.70	11.0	4.7
15	1300	460	6.47	2742	3034	39	183	1.84	-1.74	3.60	10.9	4.8
15	1300	480	6.40	2793	3081	39	176	1.76	-1.67	3.51	10.8	4.8
15	1300	500	6.34	2842	3125	38	170	1.69	-1.61	3.43	10.7	4.8
15	1300	520	6.28	2888	3168	37	163	1.63	-1.55	3.35	10.6	4.9
15	1300	540	6.22	2933	3208	37	158	1.57	-1.49	3.28	10.5	4.9
15	1300	560	6.17	2975	3247	36	152	1.52	-1.44	3.21	10.4	4.9
15	1300	580	6.12	3015	3284	36	147	1.47	-1.40	3.15	10.3	5.0
15	1300	600	6.06	3054	3319	35	143	1.42	-1.35	3.09	10.2	5.0
15	1400	400	7.13	2679	3022	43	222	2.21	-2.09	3.98	12.0	5.1
15	1400	420	7.06	2742	3079	43	213	2.11	-1.99	3.87	11.9	5.2
15	1400	440	6.99	2802	3133	42	204	2.01	-1.90	3.77	11.8	5.2
15	1400	460	6.93	2860	3184	41	196	1.93	-1.82	3.68	11.7	5.3
15	1400	480	6.86	2914	3233	40	188	1.85	-1.75	3.59	11.6	5.3
15	1400	500	6.80	2965	3279	40	182	1.78	-1.68	3.51	11.5	5.4
15	1400	520	6.74	3015	3324	39	175	1.71	-1.62	3.43	11.4	5.4
15	1400	540	6.69	3061	3366	39	169	1.65	-1.57	3.36	11.3	5.4
15	1400	560	6.63	3106	3407	38	164	1.60	-1.52	3.29	11.2	5.5
15	1400	580	6.58	3149	3446	38	159	1.54	-1.47	3.23	11.1	5.5
15	1400	600	6.53	3190	3483	37	154	1.50	-1.42	3.17	11.0	5.5

**Figure 6-66 (Sheet 11 of 21)**

# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	1500	400	7.57	2781	3160	45	236	2.31	-2.17	4.05	12.8	5.6
15	1500	420	7.51	2847	3218	44	226	2.20	-2.07	3.94	12.7	5.7
15	1500	440	7.44	2910	3274	44	217	2.10	-1.98	3.84	12.6	5.7
15	1500	460	7.38	2970	3327	43	208	2.01	-1.90	3.75	12.5	5.9
15	1500	480	7.32	3027	3378	42	201	1.93	-1.83	3.66	12.4	5.8
15	1500	500	7.26	3081	3427	42	193	1.86	-1.76	3.58	12.3	5.9
15	1500	520	7.20	3133	3473	41	187	1.79	-1.70	3.50	12.2	5.9
15	1500	540	7.14	3182	3518	41	181	1.73	-1.64	3.43	12.1	6.0
15	1500	560	7.09	3229	3560	40	175	1.67	-1.59	3.36	12.0	6.0
15	1500	580	7.04	3274	3601	40	170	1.62	-1.54	3.30	11.9	6.0
15	1500	600	6.99	3317	3640	39	165	1.57	-1.49	3.24	11.8	6.1
15	1600	400	8.01	2877	3292	47	248	2.40	-2.25	4.11	13.5	6.1
15	1600	420	7.95	2946	3353	46	238	2.28	-2.15	4.00	13.4	6.2
15	1600	440	7.88	3012	3410	46	229	2.19	-2.06	3.91	13.3	6.2
15	1600	460	7.82	3074	3466	45	220	2.10	-1.98	3.81	13.2	6.3
15	1600	480	7.76	3134	3518	44	213	2.01	-1.90	3.73	13.1	6.4
15	1600	500	7.70	3190	3569	44	205	1.94	-1.83	3.65	13.0	6.4
15	1600	520	7.65	3244	3617	43	199	1.87	-1.77	3.57	12.9	6.5
15	1600	540	7.59	3295	3663	42	192	1.81	-1.71	3.50	12.8	6.5
15	1600	560	7.54	3344	3707	42	186	1.75	-1.66	3.44	12.7	6.6
15	1600	580	7.49	3391	3750	41	181	1.69	-1.61	3.37	12.7	6.6
15	1600	600	7.44	3436	3790	41	176	1.65	-1.56	3.32	12.6	6.6
15	1700	400	8.44	2963	3420	49	261	2.48	-2.33	4.17	14.3	6.6
15	1700	420	8.38	3040	3483	48	251	2.37	-2.23	4.07	14.2	6.7
15	1700	440	8.32	3108	3542	47	241	2.27	-2.14	3.97	14.1	6.7
15	1700	460	8.26	3172	3599	47	232	2.18	-2.05	3.88	14.0	6.8
15	1700	480	8.20	3234	3654	46	224	2.09	-1.98	3.79	13.9	6.9
15	1700	500	8.14	3293	3706	45	217	2.02	-1.91	3.71	13.8	6.9
15	1700	520	8.09	3348	3755	45	210	1.95	-1.84	3.64	13.7	7.0
15	1700	540	8.03	3402	3803	44	204	1.88	-1.78	3.57	13.6	7.1
15	1700	560	7.98	3453	3849	44	198	1.82	-1.73	3.50	13.5	7.1
15	1700	580	7.93	3502	3893	43	192	1.77	-1.68	3.44	13.4	7.2
15	1700	600	7.88	3548	3935	43	187	1.72	-1.63	3.38	13.3	7.2
15	1800	400	8.87	3054	3545	50	273	2.57	-2.41	4.23	15.0	7.1
15	1800	420	8.80	3128	3609	50	263	2.45	-2.31	4.12	14.9	7.2
15	1800	440	8.74	3193	3670	49	253	2.35	-2.21	4.03	14.8	7.2
15	1800	460	8.68	3265	3728	48	244	2.26	-2.13	3.94	14.7	7.3
15	1800	480	8.63	3323	3784	48	236	2.17	-2.05	3.85	14.6	7.4
15	1800	500	8.57	3389	3838	47	229	2.09	-1.98	3.77	14.5	7.5
15	1800	520	8.52	3447	3899	46	221	2.02	-1.91	3.70	14.4	7.5
15	1800	540	8.47	3503	3938	46	215	1.96	-1.85	3.63	14.3	7.6
15	1800	560	8.42	3555	3985	45	209	1.90	-1.80	3.57	14.2	7.6
15	1800	580	8.37	3606	4030	45	203	1.84	-1.74	3.51	14.1	7.7
15	1800	600	8.32	3654	4074	45	198	1.79	-1.69	3.45	14.1	7.8
15	1900	400	9.29	3135	3666	52	286	2.65	-2.49	4.28	15.7	7.6
15	1900	420	9.22	3212	3731	51	275	2.53	-2.38	4.18	15.6	7.7
15	1900	440	9.16	3284	3794	51	265	2.43	-2.29	4.08	15.5	7.8
15	1900	460	9.11	3353	3854	50	256	2.34	-2.20	3.99	15.4	7.8
15	1900	480	9.05	3419	3911	49	248	2.25	-2.12	3.91	15.3	7.9
15	1900	500	9.00	3481	3966	49	240	2.17	-2.05	3.83	15.2	8.0
15	1900	520	8.94	3541	4018	48	233	2.10	-1.98	3.76	15.1	8.1
15	1900	540	8.89	3598	4069	48	226	2.03	-1.92	3.69	15.0	8.1
15	1900	560	8.84	3652	4117	47	220	1.97	-1.86	3.63	14.9	8.2
15	1900	580	8.80	3704	4163	47	214	1.91	-1.81	3.57	14.9	8.3
15	1900	600	8.75	3754	4203	46	209	1.86	-1.76	3.51	14.8	8.3
15	2000	400	9.70	3213	3784	53	297	2.73	-2.56	4.33	16.4	8.1
15	2000	420	9.64	3291	3851	53	287	2.61	-2.46	4.23	16.3	8.2
15	2000	440	9.58	3366	3915	52	277	2.51	-2.36	4.13	16.2	8.3
15	2000	460	9.52	3436	3976	51	268	2.41	-2.27	4.05	16.1	8.4
15	2000	480	9.47	3504	4034	51	259	2.32	-2.19	3.96	16.0	8.4
15	2000	500	9.41	3568	4090	50	251	2.25	-2.12	3.89	15.9	8.5
15	2000	520	9.36	3629	4144	50	244	2.17	-2.05	3.82	15.8	8.6
15	2000	540	9.31	3688	4195	49	237	2.10	-1.99	3.75	15.7	8.7
15	2000	560	9.27	3744	4245	49	231	2.04	-1.93	3.69	15.7	8.7
15	2000	580	9.22	3793	4292	48	225	1.98	-1.87	3.63	15.6	8.8
15	2000	600	9.17	3849	4338	48	219	1.93	-1.82	3.57	15.5	8.9

Figure 6-66 (Sheet 12 of 21)

# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	900	400	3.29	1751	1969	34	129	1.84	-1.76	3.41	6.7	2.1
20	900	420	3.89	1783	1997	34	122	1.74	-1.67	3.29	6.6	2.1
20	900	440	3.81	1812	2023	33	115	1.65	-1.58	3.18	6.4	2.1
20	900	460	3.73	1840	2048	32	109	1.57	-1.51	3.08	6.3	2.0
20	900	480	3.65	1865	2071	32	103	1.50	-1.44	2.98	6.2	2.0
20	900	500	3.58	1889	2093	31	98	1.43	-1.38	2.89	6.1	2.0
20	900	520	3.51	1912	2113	31	94	1.37	-1.32	2.81	5.9	2.0
20	900	540	3.44	1933	2132	30	89	1.32	-1.27	2.73	5.8	2.0
20	900	560	3.38	1953	2150	30	86	1.27	-1.22	2.66	5.7	2.0
20	900	580	3.32	1972	2167	29	82	1.22	-1.18	2.59	5.6	2.0
20	900	600	3.26	1989	2183	29	78	1.18	-1.14	2.52	5.5	2.0
20	1000	400	4.43	1890	2138	36	141	1.94	-1.85	3.50	7.5	2.5
20	1000	420	4.34	1925	2170	35	133	1.83	-1.75	3.38	7.3	2.4
20	1000	440	4.25	1959	2199	35	126	1.74	-1.67	3.27	7.2	2.4
20	1000	460	4.17	1990	2227	34	120	1.66	-1.59	3.16	7.0	2.4
20	1000	480	4.09	2019	2253	33	114	1.59	-1.52	3.07	6.9	2.4
20	1000	500	4.02	2047	2278	33	108	1.52	-1.46	2.98	6.8	2.4
20	1000	520	3.94	2072	2301	32	103	1.45	-1.40	2.90	6.7	2.4
20	1000	540	3.87	2096	2323	32	99	1.40	-1.35	2.82	6.5	2.4
20	1000	560	3.81	2119	2343	31	94	1.35	-1.30	2.75	6.4	2.4
20	1000	580	3.74	2141	2363	31	90	1.30	-1.25	2.68	6.3	2.4
20	1000	600	3.68	2161	2381	31	87	1.25	-1.21	2.61	6.2	2.4
20	1100	400	4.87	2020	2300	38	153	2.03	-1.94	3.58	8.2	2.9
20	1100	420	4.78	2060	2335	37	144	1.93	-1.84	3.46	8.1	2.9
20	1100	440	4.69	2097	2368	36	137	1.83	-1.75	3.35	7.9	2.9
20	1100	460	4.61	2131	2398	36	130	1.75	-1.67	3.25	7.8	2.9
20	1100	480	4.53	2164	2427	35	124	1.67	-1.60	3.15	7.6	2.9
20	1100	500	4.45	2195	2455	34	118	1.60	-1.54	3.06	7.5	2.8
20	1100	520	4.38	2223	2481	34	113	1.54	-1.47	2.98	7.4	2.8
20	1100	540	4.30	2250	2505	33	108	1.48	-1.42	2.90	7.3	2.8
20	1100	560	4.24	2276	2528	33	104	1.42	-1.37	2.83	7.2	2.8
20	1100	580	4.17	2300	2550	32	99	1.37	-1.32	2.76	7.0	2.8
20	1100	600	4.11	2323	2571	32	96	1.33	-1.28	2.70	6.9	2.8
20	1200	400	5.31	2143	2456	40	164	2.13	-2.03	3.65	9.0	3.3
20	1200	420	5.22	2186	2494	39	156	2.02	-1.93	3.53	8.8	3.3
20	1200	440	5.13	2227	2529	38	148	1.92	-1.84	3.43	8.7	3.3
20	1200	460	5.04	2265	2563	37	141	1.84	-1.76	3.32	8.5	3.3
20	1200	480	4.96	2300	2595	37	134	1.76	-1.68	3.23	8.4	3.3
20	1200	500	4.88	2334	2624	36	128	1.68	-1.61	3.14	8.3	3.3
20	1200	520	4.81	2366	2653	36	123	1.62	-1.55	3.06	8.1	3.3
20	1200	540	4.73	2396	2680	35	118	1.56	-1.49	2.99	8.0	3.3
20	1200	560	4.66	2424	2705	34	113	1.50	-1.44	2.91	7.9	3.3
20	1200	580	4.60	2451	2729	34	109	1.45	-1.39	2.85	7.8	3.3
20	1200	600	4.53	2476	2752	34	104	1.40	-1.35	2.78	7.7	3.3
20	1300	400	5.74	2258	2606	41	176	2.22	-2.12	3.72	9.7	3.7
20	1300	420	5.65	2305	2646	41	167	2.11	-2.01	3.61	9.5	3.7
20	1300	440	5.56	2349	2685	40	159	2.01	-1.92	3.50	9.4	3.7
20	1300	460	5.47	2390	2721	39	152	1.92	-1.84	3.40	9.3	3.7
20	1300	480	5.39	2429	2755	38	145	1.84	-1.76	3.31	9.1	3.7
20	1300	500	5.31	2466	2787	38	139	1.77	-1.69	3.22	9.0	3.7
20	1300	520	5.24	2500	2818	37	133	1.70	-1.63	3.14	8.9	3.7
20	1300	540	5.16	2533	2847	37	127	1.64	-1.57	3.06	8.7	3.7
20	1300	560	5.09	2564	2875	36	122	1.58	-1.51	2.99	8.6	3.7
20	1300	580	5.02	2593	2901	36	118	1.53	-1.46	2.93	8.5	3.7
20	1300	600	4.96	2621	2926	35	114	1.48	-1.42	2.86	8.4	3.7
20	1400	400	6.17	2367	2750	43	188	2.32	-2.20	3.79	10.4	4.1
20	1400	420	6.08	2417	2793	42	179	2.20	-2.09	3.68	10.3	4.1
20	1400	440	5.99	2464	2834	42	170	2.10	-2.00	3.57	10.1	4.2
20	1400	460	5.90	2509	2873	41	162	2.01	-1.91	3.47	10.0	4.2
20	1400	480	5.82	2550	2909	40	155	1.93	-1.84	3.38	9.8	4.2
20	1400	500	5.74	2590	2944	39	149	1.85	-1.76	3.30	9.7	4.2
20	1400	520	5.66	2627	2977	39	143	1.78	-1.70	3.22	9.6	4.2
20	1400	540	5.59	2662	3008	38	137	1.71	-1.64	3.14	9.4	4.2
20	1400	560	5.52	2696	3038	38	132	1.66	-1.58	3.07	9.3	4.2
20	1400	580	5.45	2728	3066	37	127	1.60	-1.53	3.00	9.2	4.2
20	1400	600	5.38	2759	3093	37	123	1.55	-1.48	2.94	9.1	4.2

Figure 6-66 (Sheet 13 of 21)

## Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		#/kn
20	1500	400	6.60	2470	2890	45	199	2.41	-2.28	3.86	11.2	4.6
20	1500	420	6.50	2523	2936	44	190	2.29	-2.18	3.74	11.0	4.6
20	1500	440	6.41	2573	2979	43	181	2.19	-2.08	3.64	10.8	4.6
20	1500	460	6.33	2621	3019	42	173	2.09	-1.99	3.54	10.7	4.6
20	1500	480	6.25	2665	3058	42	166	2.01	-1.91	3.45	10.6	4.6
20	1500	500	6.17	2707	3095	41	159	1.93	-1.84	3.37	10.4	4.7
20	1500	520	6.09	2747	3130	40	153	1.86	-1.77	3.29	10.3	4.7
20	1500	540	6.01	2785	3163	40	147	1.79	-1.71	3.21	10.2	4.7
20	1500	560	5.94	2821	3195	39	142	1.73	-1.65	3.14	10.0	4.7
20	1500	580	5.87	2855	3225	39	137	1.68	-1.60	3.08	9.9	4.7
20	1500	600	5.81	2887	3254	38	132	1.62	-1.55	3.02	9.8	4.7
20	1600	400	7.02	2568	3025	46	211	2.49	-2.36	3.92	11.9	5.0
20	1600	420	6.92	2624	3073	46	201	2.38	-2.26	3.81	11.7	5.1
20	1600	440	6.83	2677	3118	45	192	2.27	-2.16	3.70	11.6	5.1
20	1600	460	6.75	2726	3161	44	184	2.18	-2.07	3.61	11.4	5.1
20	1600	480	6.67	2774	3202	43	176	2.09	-1.99	3.52	11.3	5.1
20	1600	500	6.59	2818	3241	43	170	2.01	-1.91	3.43	11.1	5.1
20	1600	520	6.51	2861	3278	42	163	1.94	-1.84	3.36	11.0	5.1
20	1600	540	6.43	2901	3313	41	157	1.87	-1.78	3.28	10.9	5.2
20	1600	560	6.36	2939	3346	41	152	1.81	-1.72	3.21	10.8	5.2
20	1600	580	6.29	2975	3378	40	146	1.75	-1.67	3.15	10.6	5.2
20	1600	600	6.23	3010	3409	40	142	1.70	-1.62	3.09	10.5	5.2
20	1700	400	7.43	2660	3157	48	222	2.58	-2.44	3.98	12.6	5.5
20	1700	420	7.34	2719	3207	47	212	2.46	-2.33	3.87	12.4	5.5
20	1700	440	7.25	2774	3254	46	203	2.35	-2.23	3.77	12.3	5.5
20	1700	460	7.16	2827	3299	46	195	2.26	-2.14	3.67	12.1	5.6
20	1700	480	7.08	2876	3341	45	187	2.17	-2.06	3.58	12.0	5.6
20	1700	500	7.00	2923	3382	44	180	2.09	-1.98	3.50	11.8	5.6
20	1700	520	6.93	2968	3420	44	173	2.01	-1.91	3.42	11.7	5.6
20	1700	540	6.85	3010	3457	43	167	1.94	-1.85	3.35	11.6	5.6
20	1700	560	6.78	3051	3492	43	161	1.88	-1.79	3.28	11.5	5.7
20	1700	580	6.71	3089	3526	42	156	1.82	-1.74	3.22	11.3	5.7
20	1700	600	6.64	3126	3558	42	151	1.77	-1.69	3.16	11.2	5.7
20	1800	400	7.84	2748	3285	50	233	2.66	-2.52	4.03	13.3	5.9
20	1800	420	7.75	2809	3337	49	223	2.54	-2.41	3.92	13.1	6.0
20	1800	440	7.66	2867	3385	48	214	2.43	-2.31	3.82	12.9	6.0
20	1800	460	7.58	2922	3432	47	205	2.34	-2.22	3.73	12.8	6.0
20	1800	480	7.49	2974	3476	47	197	2.25	-2.13	3.64	12.7	6.1
20	1800	500	7.42	3023	3519	46	190	2.16	-2.06	3.56	12.5	6.1
20	1800	520	7.34	3070	3559	45	183	2.09	-1.98	3.48	12.4	6.1
20	1800	540	7.27	3114	3597	45	177	2.02	-1.92	3.41	12.3	6.1
20	1800	560	7.19	3157	3634	44	171	1.95	-1.86	3.35	12.2	6.2
20	1800	580	7.13	3197	3669	44	166	1.89	-1.80	3.28	12.0	6.2
20	1800	600	7.06	3235	3702	43	161	1.84	-1.75	3.22	11.9	6.2
20	1900	400	8.25	2831	3410	51	244	2.75	-2.60	4.09	13.9	6.4
20	1900	420	8.16	2895	3463	50	234	2.62	-2.48	3.98	13.8	6.4
20	1900	440	8.07	2956	3514	49	225	2.51	-2.38	3.88	13.6	6.5
20	1900	460	7.98	3013	3562	49	216	2.41	-2.29	3.79	13.5	6.5
20	1900	480	7.90	3067	3608	48	208	2.32	-2.20	3.70	13.4	6.6
20	1900	500	7.82	3118	3651	47	200	2.24	-2.12	3.62	13.2	6.6
20	1900	520	7.75	3167	3693	47	193	2.16	-2.05	3.55	13.1	6.6
20	1900	540	7.67	3213	3733	46	187	2.09	-1.99	3.47	13.0	6.6
20	1900	560	7.60	3258	3771	46	181	2.02	-1.93	3.41	12.9	6.7
20	1900	580	7.54	3300	3808	45	175	1.96	-1.87	3.34	12.7	6.7
20	1900	600	7.47	3340	3842	45	170	1.91	-1.82	3.29	12.6	6.7
20	2000	400	8.65	2911	3532	52	255	2.82	-2.67	4.14	14.6	6.9
20	2000	420	8.56	2977	3586	52	245	2.70	-2.55	4.03	14.5	6.9
20	2000	440	8.47	3040	3639	51	235	2.59	-2.45	3.93	14.3	7.0
20	2000	460	8.39	3099	3688	50	226	2.49	-2.36	3.84	14.2	7.0
20	2000	480	8.31	3155	3736	50	218	2.40	-2.27	3.76	14.0	7.0
20	2000	500	8.23	3208	3781	49	210	2.31	-2.19	3.68	13.9	7.1
20	2000	520	8.15	3259	3824	48	203	2.23	-2.12	3.60	13.8	7.1
20	2000	540	8.08	3307	3865	48	197	2.16	-2.05	3.53	13.7	7.1
20	2000	560	8.01	3353	3904	47	191	2.10	-1.99	3.47	13.5	7.2
20	2000	580	7.94	3397	3942	47	185	2.03	-1.93	3.40	13.4	7.2
20	2000	600	7.88	3439	3978	46	180	1.98	-1.88	3.35	13.3	7.2

**Figure 6-66 (Sheet 14 of 21)**

# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	2100	400	9.04	2986	3651	54	266	2.90	-2.74	4.19	15.3	7.3
20	2100	420	8.95	3055	3707	53	256	2.78	-2.63	4.08	15.1	7.4
20	2100	440	8.87	3120	3761	52	246	2.67	-2.52	3.98	15.0	7.4
20	2100	460	8.78	3181	3812	52	237	2.56	-2.43	3.89	14.8	7.5
20	2100	480	8.70	3239	3860	51	228	2.47	-2.34	3.81	14.7	7.5
20	2100	500	8.63	3294	3907	50	221	2.38	-2.26	3.73	14.6	7.6
20	2100	520	8.55	3347	3951	50	213	2.31	-2.19	3.66	14.5	7.6
20	2100	540	8.48	3397	3994	49	207	2.23	-2.12	3.59	14.3	7.6
20	2100	560	8.41	3444	4034	49	200	2.16	-2.06	3.52	14.2	7.7
20	2100	580	8.35	3490	4073	48	195	2.10	-2.00	3.46	14.1	7.7
20	2100	600	8.28	3533	4110	48	189	2.04	-1.94	3.40	14.0	7.7
20	2200	400	9.43	3059	3768	55	277	2.98	-2.81	4.23	15.9	7.8
20	2200	420	9.35	3129	3825	54	266	2.85	-2.69	4.13	15.8	7.9
20	2200	440	9.26	3196	3880	54	256	2.74	-2.59	4.03	15.6	7.9
20	2200	460	9.18	3259	3932	53	247	2.64	-2.49	3.94	15.5	8.0
20	2200	480	9.10	3319	3982	52	238	2.54	-2.41	3.86	15.4	8.0
20	2200	500	9.02	3376	4030	52	230	2.45	-2.32	3.78	15.2	8.1
20	2200	520	8.95	3430	4075	51	223	2.37	-2.25	3.71	15.1	8.1
20	2200	540	8.88	3482	4119	51	216	2.30	-2.18	3.64	15.0	8.1
20	2200	560	8.81	3531	4161	50	210	2.23	-2.12	3.58	14.9	8.2
20	2200	580	8.74	3578	4201	50	204	2.17	-2.06	3.52	14.8	8.2
20	2200	600	8.68	3623	4239	49	198	2.11	-2.00	3.46	14.7	8.2
20	2300	400	9.82	3128	3833	56	287	3.05	-2.88	4.27	16.6	8.3
20	2300	420	9.73	3200	3941	56	276	2.93	-2.76	4.17	16.4	8.3
20	2300	440	9.65	3269	3997	55	266	2.81	-2.66	4.08	16.3	8.4
20	2300	460	9.57	3334	4050	54	257	2.71	-2.56	3.99	16.2	8.5
20	2300	480	9.49	3396	4101	54	248	2.61	-2.47	3.91	16.0	8.5
20	2300	500	9.42	3455	4150	53	240	2.52	-2.39	3.83	15.9	8.6
20	2300	520	9.34	3510	4197	53	233	2.44	-2.31	3.76	15.8	8.6
20	2300	540	9.27	3564	4241	52	226	2.37	-2.24	3.69	15.7	8.6
20	2300	560	9.20	3614	4284	51	220	2.30	-2.18	3.63	15.6	8.7
20	2300	580	9.14	3663	4325	51	213	2.24	-2.12	3.57	15.4	8.7
20	2300	600	9.08	3709	4365	51	208	2.18	-2.06	3.51	15.3	8.8
20	2400	400	10.20	3194	3995	58	298	3.12	-2.94	4.32	17.2	8.7
20	2400	420	10.12	3269	4055	57	287	3.00	-2.83	4.22	17.1	8.8
20	2400	440	10.03	3339	4112	56	276	2.88	-2.72	4.12	17.0	8.9
20	2400	460	9.95	3406	4166	56	267	2.78	-2.62	4.04	16.8	8.9
20	2400	480	9.88	3469	4218	55	258	2.68	-2.53	3.96	16.7	9.0
20	2400	500	9.80	3529	4268	54	250	2.59	-2.45	3.88	16.6	9.1
20	2400	520	9.73	3587	4316	54	243	2.51	-2.38	3.81	16.4	9.1
20	2400	540	9.66	3642	4361	53	236	2.43	-2.31	3.74	16.3	9.2
20	2400	560	9.59	3694	4405	53	229	2.37	-2.24	3.68	16.2	9.2
20	2400	580	9.53	3744	4447	52	223	2.30	-2.18	3.62	16.1	9.2
20	2400	600	9.47	3791	4487	52	217	2.24	-2.12	3.57	16.0	9.3
20	2500	400	10.58	3258	4106	59	308	3.19	-3.01	4.36	17.9	9.2
20	2500	420	10.50	3334	4167	58	297	3.06	-2.89	4.26	17.7	9.3
20	2500	440	10.42	3406	4225	57	286	2.95	-2.78	4.17	17.6	9.4
20	2500	460	10.34	3474	4280	57	277	2.84	-2.69	4.08	17.5	9.4
20	2500	480	10.26	3539	4333	56	268	2.75	-2.60	4.00	17.3	9.5
20	2500	500	10.19	3601	4384	56	260	2.66	-2.51	3.93	17.2	9.6
20	2500	520	10.12	3660	4432	55	252	2.58	-2.44	3.86	17.1	9.6
20	2500	540	10.05	3716	4479	55	245	2.50	-2.37	3.79	17.0	9.7
20	2500	560	9.98	3770	4523	54	238	2.43	-2.30	3.73	16.9	9.7
20	2500	580	9.92	3821	4566	54	232	2.36	-2.24	3.67	16.8	9.7
20	2500	600	9.85	3870	4607	53	226	2.30	-2.18	3.61	16.7	9.8
20	2600	400	10.96	3318	4216	60	318	3.26	-3.07	4.39	18.5	9.7
20	2600	420	10.87	3396	4277	59	307	3.13	-2.95	4.30	18.4	9.8
20	2600	440	10.79	3470	4336	59	296	3.02	-2.85	4.21	18.2	9.8
20	2600	460	10.72	3540	4392	58	286	2.91	-2.75	4.12	18.1	9.9
20	2600	480	10.64	3607	4446	57	278	2.81	-2.66	4.04	18.0	10.0
20	2600	500	10.57	3670	4497	57	269	2.72	-2.57	3.97	17.9	10.0
20	2600	520	10.50	3730	4547	56	262	2.64	-2.50	3.90	17.7	10.1
20	2600	540	10.43	3787	4594	56	254	2.56	-2.43	3.84	17.6	10.2
20	2600	560	10.36	3842	4639	55	248	2.49	-2.36	3.77	17.5	10.2
20	2600	580	10.30	3895	4683	55	241	2.43	-2.30	3.72	17.4	10.3
20	2600	600	10.24	3945	4725	55	235	2.36	-2.24	3.66	17.3	10.3

Figure 6-66 (Sheet 15 of 21)

## Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
25	900	400	3.38	1492	1742	37	110	1.95	-1.88	3.28	5.7	1.6
25	900	420	3.29	1514	1762	36	103	1.85	-1.78	3.15	5.6	1.6
25	900	440	3.20	1535	1779	35	97	1.75	-1.69	3.04	5.4	1.6
25	900	460	3.12	1554	1796	35	92	1.67	-1.61	2.94	5.3	1.5
25	900	480	3.04	1572	1811	34	87	1.59	-1.54	2.84	5.1	1.5
25	900	500	2.97	1588	1825	34	83	1.52	-1.47	2.75	5.0	1.5
25	900	520	2.90	1603	1838	33	78	1.46	-1.41	2.66	4.9	1.5
25	900	540	2.83	1617	1851	33	75	1.40	-1.36	2.59	4.8	1.5
25	900	560	2.77	1630	1862	33	71	1.35	-1.31	2.51	4.7	1.5
25	900	580	2.71	1643	1873	32	68	1.30	-1.26	2.44	4.6	1.4
25	900	600	2.65	1654	1883	32	65	1.25	-1.22	2.38	4.5	1.4
25	1000	400	3.78	1621	1905	38	120	2.04	-1.96	3.35	6.4	1.9
25	1000	420	3.69	1647	1927	37	113	1.94	-1.86	3.23	6.2	1.9
25	1000	440	3.59	1670	1947	37	106	1.84	-1.77	3.12	6.1	1.9
25	1000	460	3.51	1692	1966	36	100	1.75	-1.69	3.01	5.9	1.9
25	1000	480	3.43	1713	1983	35	95	1.67	-1.62	2.92	5.8	1.9
25	1000	500	3.35	1732	2000	35	90	1.60	-1.55	2.83	5.7	1.8
25	1000	520	3.27	1749	2015	34	86	1.54	-1.49	2.74	5.5	1.8
25	1000	540	3.20	1766	2029	34	82	1.48	-1.43	2.66	5.4	1.8
25	1000	560	3.13	1781	2043	34	78	1.42	-1.38	2.59	5.3	1.8
25	1000	580	3.07	1796	2055	33	75	1.37	-1.33	2.52	5.2	1.8
25	1000	600	3.01	1809	2067	33	71	1.32	-1.28	2.46	5.1	1.8
25	1100	400	4.18	1744	2062	40	130	2.14	-2.05	3.43	7.1	2.3
25	1100	420	4.08	1773	2086	39	122	2.03	-1.95	3.31	6.9	2.2
25	1100	440	3.99	1800	2109	38	115	1.93	-1.85	3.19	6.7	2.2
25	1100	460	3.90	1824	2130	37	109	1.84	-1.77	3.09	6.6	2.2
25	1100	480	3.81	1848	2150	37	104	1.76	-1.69	2.99	6.4	2.2
25	1100	500	3.73	1869	2169	36	98	1.68	-1.62	2.90	6.3	2.2
25	1100	520	3.65	1889	2186	36	94	1.61	-1.56	2.82	6.2	2.2
25	1100	540	3.58	1908	2203	35	89	1.55	-1.50	2.74	6.0	2.1
25	1100	560	3.50	1926	2218	35	85	1.49	-1.44	2.67	5.9	2.1
25	1100	580	3.44	1943	2232	34	82	1.44	-1.39	2.60	5.8	2.1
25	1100	600	3.37	1958	2246	34	78	1.39	-1.35	2.53	5.7	2.1
25	1200	400	4.58	1860	2214	41	140	2.23	-2.14	3.50	7.7	2.6
25	1200	420	4.48	1893	2241	40	132	2.12	-2.03	3.38	7.6	2.6
25	1200	440	4.38	1922	2266	39	125	2.01	-1.93	3.27	7.4	2.6
25	1200	460	4.29	1950	2290	39	118	1.92	-1.85	3.16	7.2	2.6
25	1200	480	4.20	1976	2312	38	112	1.84	-1.77	3.07	7.1	2.6
25	1200	500	4.11	2001	2333	38	107	1.76	-1.69	2.98	7.0	2.5
25	1200	520	4.03	2023	2352	37	102	1.69	-1.63	2.90	6.8	2.5
25	1200	540	3.95	2044	2371	37	97	1.63	-1.57	2.82	6.7	2.5
25	1200	560	3.88	2064	2388	36	93	1.57	-1.51	2.74	6.6	2.5
25	1200	580	3.81	2083	2404	36	89	1.51	-1.46	2.68	6.4	2.5
25	1200	600	3.74	2101	2419	35	85	1.46	-1.41	2.61	6.3	2.5
25	1300	400	4.98	1971	2361	42	150	2.32	-2.22	3.57	8.4	3.0
25	1300	420	4.88	2007	2391	42	141	2.20	-2.11	3.45	8.2	3.0
25	1300	440	4.78	2039	2419	41	134	2.10	-2.01	3.34	8.1	3.0
25	1300	460	4.68	2070	2445	40	127	2.00	-1.92	3.24	7.9	2.9
25	1300	480	4.59	2099	2469	40	121	1.92	-1.84	3.14	7.8	2.9
25	1300	500	4.50	2126	2492	39	115	1.84	-1.77	3.05	7.6	2.9
25	1300	520	4.42	2151	2513	38	110	1.77	-1.70	2.97	7.5	2.9
25	1300	540	4.34	2175	2533	38	105	1.70	-1.64	2.89	7.3	2.9
25	1300	560	4.26	2197	2553	37	100	1.64	-1.58	2.82	7.2	2.9
25	1300	580	4.18	2218	2571	37	96	1.58	-1.53	2.75	7.1	2.9
25	1300	600	4.11	2237	2588	36	92	1.53	-1.48	2.69	7.0	2.8
25	1400	400	5.38	2077	2504	44	160	2.41	-2.30	3.63	9.1	3.4
25	1400	420	5.27	2115	2536	43	151	2.29	-2.19	3.51	8.9	3.4
25	1400	440	5.17	2151	2566	42	143	2.18	-2.09	3.40	8.7	3.3
25	1400	460	5.07	2184	2595	42	136	2.09	-2.00	3.30	8.6	3.3
25	1400	480	4.98	2216	2621	41	130	2.00	-1.92	3.21	8.4	3.3
25	1400	500	4.89	2245	2646	40	124	1.92	-1.84	3.12	8.3	3.3
25	1400	520	4.80	2273	2669	40	118	1.84	-1.77	3.04	8.1	3.3
25	1400	540	4.72	2299	2692	39	113	1.78	-1.71	2.96	8.0	3.3
25	1400	560	4.64	2323	2712	39	108	1.71	-1.65	2.89	7.8	3.3
25	1400	580	4.56	2346	2732	38	104	1.66	-1.59	2.82	7.7	3.2
25	1400	600	4.49	2368	2751	38	100	1.60	-1.54	2.76	7.6	3.2

Figure 6-66 (Sheet 16 of 21)



# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
25	1500	400	5.78	2177	2644	45	170	2.50	-2.38	3.69	9.8	3.8
25	1500	420	5.67	2218	2678	45	161	2.38	-2.27	3.58	9.6	3.8
25	1500	440	5.56	2257	2710	44	153	2.27	-2.17	3.47	9.4	3.7
25	1500	460	5.46	2293	2740	43	145	2.17	-2.07	3.37	9.2	3.7
25	1500	480	5.37	2327	2769	42	139	2.08	-1.99	3.28	9.1	3.7
25	1500	500	5.28	2359	2796	42	132	2.00	-1.91	3.19	8.9	3.7
25	1500	520	5.19	2389	2821	41	127	1.92	-1.84	3.11	8.8	3.7
25	1500	540	5.10	2417	2845	41	121	1.85	-1.78	3.03	8.6	3.7
25	1500	560	5.02	2444	2868	40	116	1.79	-1.72	2.96	8.5	3.7
25	1500	580	4.94	2469	2889	39	112	1.73	-1.66	2.89	8.4	3.7
25	1500	600	4.87	2493	2909	39	108	1.67	-1.61	2.83	8.2	3.6
25	1600	400	6.17	2272	2779	47	180	2.58	-2.46	3.75	10.4	4.2
25	1600	420	6.06	2317	2816	46	171	2.46	-2.35	3.64	10.2	4.2
25	1600	440	5.96	2358	2850	45	162	2.35	-2.24	3.53	10.1	4.2
25	1600	460	5.86	2397	2882	44	155	2.25	-2.15	3.43	9.9	4.1
25	1600	480	5.76	2434	2912	44	148	2.16	-2.06	3.34	9.7	4.1
25	1600	500	5.66	2468	2941	43	141	2.07	-1.98	3.25	9.6	4.1
25	1600	520	5.58	2500	2968	42	135	2.00	-1.91	3.17	9.4	4.1
25	1600	540	5.49	2531	2994	42	130	1.92	-1.84	3.10	9.3	4.1
25	1600	560	5.41	2559	3018	41	125	1.86	-1.78	3.03	9.1	4.1
25	1600	580	5.33	2587	3041	41	120	1.80	-1.73	2.96	9.0	4.1
25	1600	600	5.25	2612	3063	40	115	1.74	-1.67	2.90	8.9	4.1
25	1700	400	6.57	2364	2911	48	190	2.67	-2.54	3.81	11.1	4.6
25	1700	420	6.45	2411	2950	47	180	2.54	-2.42	3.70	10.9	4.6
25	1700	440	6.35	2455	2986	47	172	2.43	-2.32	3.59	10.7	4.6
25	1700	460	6.24	2496	3020	46	164	2.33	-2.22	3.49	10.6	4.6
25	1700	480	6.15	2535	3052	45	157	2.23	-2.13	3.40	10.4	4.6
25	1700	500	6.05	2572	3083	44	150	2.15	-2.05	3.32	10.2	4.6
25	1700	520	5.96	2606	3112	44	144	2.07	-1.98	3.24	10.1	4.5
25	1700	540	5.87	2639	3139	43	138	2.00	-1.91	3.16	9.9	4.5
25	1700	560	5.79	2670	3165	43	133	1.93	-1.85	3.09	9.8	4.5
25	1700	580	5.71	2699	3190	42	128	1.87	-1.79	3.03	9.7	4.5
25	1700	600	5.63	2726	3213	42	123	1.81	-1.74	2.96	9.5	4.5
25	1800	400	6.96	2450	3041	50	200	2.75	-2.62	3.87	11.8	5.0
25	1800	420	6.84	2500	3081	49	190	2.62	-2.50	3.75	11.6	5.0
25	1800	440	6.74	2547	3119	48	181	2.51	-2.39	3.65	11.4	5.0
25	1800	460	6.63	2591	3155	47	173	2.40	-2.29	3.55	11.2	5.0
25	1800	480	6.53	2632	3188	46	166	2.31	-2.20	3.46	11.0	5.0
25	1800	500	6.44	2671	3221	46	159	2.22	-2.12	3.38	10.9	5.0
25	1800	520	6.35	2707	3251	45	153	2.14	-2.05	3.30	10.7	5.0
25	1800	540	6.26	2742	3280	45	147	2.07	-1.98	3.22	10.6	5.0
25	1800	560	6.17	2775	3308	44	141	2.00	-1.92	3.15	10.4	5.0
25	1800	580	6.09	2806	3334	44	136	1.94	-1.86	3.09	10.3	5.0
25	1800	600	6.01	2835	3359	43	131	1.88	-1.80	3.03	10.2	4.9
25	1900	400	7.34	2533	3167	51	210	2.83	-2.69	3.92	12.4	5.4
25	1900	420	7.23	2586	3209	50	200	2.70	-2.57	3.81	12.2	5.4
25	1900	440	7.12	2635	3248	49	191	2.59	-2.46	3.70	12.0	5.4
25	1900	460	7.02	2681	3286	49	183	2.48	-2.36	3.61	11.9	5.4
25	1900	480	6.92	2724	3321	48	175	2.38	-2.27	3.52	11.7	5.4
25	1900	500	6.82	2765	3355	47	168	2.30	-2.19	3.44	11.5	5.4
25	1900	520	6.73	2804	3387	47	161	2.22	-2.12	3.36	11.4	5.4
25	1900	540	6.64	2841	3418	46	155	2.14	-2.05	3.28	11.2	5.4
25	1900	560	6.56	2875	3446	45	150	2.07	-1.98	3.22	11.1	5.4
25	1900	580	6.48	2908	3474	45	144	2.01	-1.92	3.15	10.9	5.4
25	1900	600	6.40	2940	3500	44	139	1.95	-1.87	3.09	10.8	5.4
25	2000	400	7.73	2613	3290	52	219	2.91	-2.76	3.97	13.1	5.9
25	2000	420	7.61	2667	3334	51	209	2.78	-2.64	3.86	12.9	5.9
25	2000	440	7.51	2719	3375	51	200	2.66	-2.53	3.76	12.7	5.9
25	2000	460	7.40	2767	3414	50	192	2.56	-2.43	3.66	12.5	5.9
25	2000	480	7.30	2813	3451	49	184	2.46	-2.34	3.58	12.3	5.9
25	2000	500	7.21	2856	3486	49	177	2.37	-2.26	3.49	12.2	5.9
25	2000	520	7.11	2896	3520	48	170	2.29	-2.18	3.42	12.0	5.9
25	2000	540	7.03	2935	3552	47	164	2.21	-2.11	3.34	11.9	5.9
25	2000	560	6.94	2972	3582	47	158	2.14	-2.05	3.27	11.7	5.9
25	2000	580	6.86	3006	3611	46	153	2.08	-1.98	3.21	11.6	5.9
25	2000	600	6.78	3039	3638	46	148	2.02	-1.93	3.15	11.5	5.9

Figure 6-66 (Sheet 17 of 21)

## Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
25	2100	400	7.11	2683	3411	54	229	2.98	-2.33	4.02	13.7	6.3
25	2100	420	7.93	2745	3457	53	219	2.85	-2.71	3.91	13.5	6.3
25	2100	440	7.89	2799	3499	52	210	2.74	-2.60	3.81	13.3	6.3
25	2100	460	7.78	2850	3540	51	201	2.63	-2.50	3.72	13.2	6.3
25	2100	480	7.68	2897	3578	50	193	2.53	-2.41	3.63	13.0	6.3
25	2100	500	7.59	2942	3615	50	186	2.44	-2.33	3.55	12.8	6.3
25	2100	520	7.49	2985	3650	49	179	2.36	-2.25	3.47	12.7	6.3
25	2100	540	7.41	3025	3683	49	172	2.28	-2.18	3.40	12.5	6.3
25	2100	560	7.32	3064	3714	48	167	2.21	-2.11	3.33	12.4	6.3
25	2100	580	7.24	3100	3744	49	161	2.14	-2.05	3.27	12.2	6.3
25	2100	600	7.16	3135	3773	47	156	2.08	-1.99	3.21	12.1	6.3
25	2200	400	8.43	2761	3530	55	233	3.05	-2.20	4.06	14.3	6.7
25	2200	420	8.37	2820	3577	54	223	2.93	-2.78	3.96	14.2	6.7
25	2200	440	8.27	2876	3621	53	219	2.81	-2.67	3.86	14.0	6.8
25	2200	460	8.16	2929	3663	52	210	2.70	-2.57	3.77	13.8	6.8
25	2200	480	8.06	2973	3703	52	202	2.60	-2.48	3.68	13.6	6.8
25	2200	500	7.97	3025	3740	51	195	2.51	-2.39	3.60	13.5	6.8
25	2200	520	7.87	3070	3777	51	188	2.43	-2.31	3.52	13.3	6.8
25	2200	540	7.78	3112	3811	50	181	2.35	-2.24	3.45	13.2	6.8
25	2200	560	7.70	3152	3844	49	175	2.28	-2.17	3.38	13.0	6.8
25	2200	580	7.62	3190	3875	49	169	2.21	-2.11	3.32	12.9	6.8
25	2200	600	7.54	3226	3905	48	164	2.15	-2.05	3.26	12.7	6.8
25	2300	400	8.86	2831	3647	56	248	3.13	-2.97	4.11	15.0	7.2
25	2300	420	8.75	2892	3695	55	238	3.00	-2.85	4.00	14.8	7.2
25	2300	440	8.64	2950	3740	54	228	2.88	-2.74	3.90	14.6	7.2
25	2300	460	8.54	3004	3784	54	219	2.77	-2.63	3.81	14.4	7.2
25	2300	480	8.44	3056	3825	53	211	2.67	-2.54	3.73	14.3	7.2
25	2300	500	8.34	3104	3864	52	203	2.58	-2.45	3.65	14.1	7.2
25	2300	520	8.25	3151	3901	52	196	2.49	-2.37	3.57	13.9	7.3
25	2300	540	8.16	3195	3936	51	190	2.42	-2.30	3.50	13.8	7.3
25	2300	560	8.08	3236	3970	51	183	2.34	-2.23	3.44	13.6	7.3
25	2300	580	7.99	3275	4003	50	178	2.28	-2.17	3.37	13.5	7.3
25	2300	600	7.91	3314	4034	50	172	2.21	-2.11	3.32	13.4	7.3
25	2400	400	9.23	2897	3762	57	258	3.20	-3.04	4.15	15.6	7.6
25	2400	420	9.12	2961	3811	56	247	3.07	-2.91	4.04	15.4	7.6
25	2400	440	9.01	3020	3858	56	237	2.95	-2.80	3.95	15.2	7.7
25	2400	460	8.91	3077	3902	55	228	2.84	-2.70	3.86	15.1	7.7
25	2400	480	8.81	3130	3944	54	220	2.74	-2.60	3.78	14.9	7.7
25	2400	500	8.72	3181	3984	54	212	2.65	-2.52	3.70	14.7	7.7
25	2400	520	8.62	3228	4023	53	205	2.56	-2.44	3.62	14.6	7.7
25	2400	540	8.54	3274	4059	52	198	2.48	-2.36	3.55	14.4	7.7
25	2400	560	8.45	3317	4094	52	192	2.41	-2.29	3.49	14.3	7.7
25	2400	580	8.37	3358	4128	51	186	2.34	-2.23	3.43	14.1	7.9
25	2400	600	8.29	3397	4160	51	180	2.28	-2.17	3.37	14.0	7.9
25	2500	400	9.60	2962	3876	58	267	3.27	-3.10	4.19	16.2	8.1
25	2500	420	9.49	3027	3926	58	256	3.14	-2.98	4.09	16.0	8.1
25	2500	440	9.39	3088	3973	57	246	3.02	-2.86	3.99	15.9	8.1
25	2500	460	9.28	3146	4019	56	237	2.91	-2.76	3.90	15.7	8.1
25	2500	480	9.18	3201	4062	55	229	2.80	-2.66	3.82	15.5	8.2
25	2500	500	9.09	3253	4103	55	221	2.71	-2.58	3.74	15.4	8.2
25	2500	520	9.00	3303	4142	54	214	2.62	-2.50	3.67	15.2	8.2
25	2500	540	8.91	3350	4180	54	207	2.55	-2.42	3.60	15.1	8.2
25	2500	560	8.82	3395	4216	53	200	2.47	-2.35	3.54	14.9	8.2
25	2500	580	8.74	3437	4250	53	194	2.40	-2.29	3.48	14.8	8.2
25	2500	600	8.66	3478	4283	52	189	2.34	-2.23	3.42	14.6	8.2
25	2600	400	9.97	3023	3987	59	276	3.34	-3.16	4.23	16.9	8.5
25	2600	420	9.86	3090	4038	59	265	3.20	-3.04	4.13	16.7	8.5
25	2600	440	9.75	3153	4087	58	255	3.08	-2.92	4.03	16.5	8.6
25	2600	460	9.65	3213	4133	57	246	2.97	-2.82	3.95	16.3	8.6
25	2600	480	9.55	3270	4178	57	237	2.87	-2.73	3.86	16.1	8.6
25	2600	500	9.46	3324	4220	56	229	2.73	-2.64	3.79	16.0	8.6
25	2600	520	9.37	3375	4260	55	222	2.69	-2.56	3.72	15.8	8.7
25	2600	540	9.28	3423	4298	55	215	2.61	-2.48	3.65	15.7	8.7
25	2600	560	9.19	3469	4335	54	209	2.53	-2.41	3.58	15.5	8.7
25	2600	580	9.11	3513	4371	54	203	2.46	-2.35	3.52	15.4	8.7
25	2600	600	9.03	3555	4404	53	197	2.40	-2.29	3.47	15.3	8.7

**Figure 6-66 (Sheet 18 of 21)**

**Ballistic Table — BDU-33 High Drag Bomb**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	900	400	2.93	1273	1559	40	96	2.06	-2.00	3.17	4.9	1.3
30	900	420	2.94	1289	1572	39	90	1.96	-1.90	3.05	4.8	1.2
30	900	440	2.75	1303	1594	33	84	1.86	-1.80	2.93	4.7	1.2
30	900	460	2.67	1317	1595	38	80	1.77	-1.72	2.83	4.5	1.2
30	900	480	2.60	1329	1605	37	75	1.69	-1.64	2.73	4.4	1.2
30	900	500	2.52	1340	1615	37	71	1.62	-1.58	2.64	4.3	1.2
30	900	520	2.46	1351	1623	37	68	1.55	-1.51	2.56	4.2	1.2
30	900	540	2.39	1360	1631	36	64	1.49	-1.45	2.48	4.0	1.1
30	900	560	2.33	1369	1639	36	61	1.44	-1.40	2.40	3.9	1.1
30	900	580	2.27	1378	1646	36	58	1.38	-1.35	2.33	3.8	1.1
30	900	600	2.22	1385	1652	35	56	1.34	-1.30	2.27	3.8	1.1
30	1000	400	3.29	1390	1712	41	104	2.15	-2.08	3.24	5.6	1.5
30	1000	420	3.19	1403	1727	40	97	2.04	-1.97	3.12	5.4	1.5
30	1000	440	3.10	1425	1741	39	92	1.94	-1.88	3.01	5.2	1.5
30	1000	460	3.01	1441	1754	39	86	1.85	-1.79	2.90	5.1	1.5
30	1000	480	2.93	1455	1766	39	82	1.77	-1.71	2.80	5.0	1.4
30	1000	500	2.85	1469	1777	38	77	1.69	-1.64	2.71	4.8	1.4
30	1000	520	2.78	1481	1787	38	73	1.62	-1.58	2.63	4.7	1.4
30	1000	540	2.71	1492	1797	37	70	1.56	-1.52	2.55	4.6	1.4
30	1000	560	2.64	1503	1805	37	67	1.50	-1.46	2.47	4.5	1.4
30	1000	580	2.58	1513	1814	36	64	1.45	-1.41	2.41	4.4	1.4
30	1000	600	2.52	1522	1821	36	61	1.40	-1.36	2.34	4.3	1.3
30	1100	400	3.65	1502	1862	42	112	2.24	-2.16	3.31	6.2	1.8
30	1100	420	3.54	1523	1879	41	105	2.12	-2.05	3.19	6.0	1.8
30	1100	440	3.45	1543	1895	41	99	2.02	-1.95	3.07	5.8	1.8
30	1100	460	3.36	1561	1909	40	94	1.93	-1.87	2.97	5.7	1.8
30	1100	480	3.27	1577	1923	39	88	1.84	-1.79	2.87	5.5	1.7
30	1100	500	3.19	1593	1936	39	84	1.77	-1.71	2.78	5.4	1.7
30	1100	520	3.11	1607	1947	39	80	1.69	-1.64	2.70	5.3	1.7
30	1100	540	3.04	1620	1958	38	76	1.63	-1.58	2.62	5.1	1.7
30	1100	560	2.96	1632	1968	38	72	1.57	-1.53	2.54	5.0	1.6
30	1100	580	2.90	1644	1978	37	69	1.51	-1.47	2.48	4.9	1.6
30	1100	600	2.83	1655	1987	37	66	1.46	-1.42	2.41	4.8	1.6
30	1200	400	4.01	1609	2008	43	120	2.33	-2.24	3.37	6.8	2.1
30	1200	420	3.90	1633	2027	42	113	2.21	-2.13	3.25	6.6	2.1
30	1200	440	3.80	1656	2045	42	107	2.10	-2.03	3.14	6.4	2.1
30	1200	460	3.70	1676	2061	41	101	2.01	-1.94	3.04	6.3	2.1
30	1200	480	3.61	1695	2077	41	95	1.92	-1.86	2.94	6.1	2.0
30	1200	500	3.53	1712	2091	40	91	1.84	-1.78	2.85	6.0	2.0
30	1200	520	3.45	1729	2104	40	86	1.77	-1.71	2.77	5.8	2.0
30	1200	540	3.37	1744	2117	39	82	1.70	-1.65	2.69	5.7	2.0
30	1200	560	3.29	1758	2128	39	78	1.64	-1.59	2.61	5.6	1.9
30	1200	580	3.22	1771	2139	38	75	1.58	-1.53	2.54	5.4	1.9
30	1200	600	3.15	1783	2149	38	71	1.53	-1.48	2.48	5.3	1.9
30	1300	400	4.38	1713	2150	44	129	2.41	-2.32	3.44	7.4	2.4
30	1300	420	4.26	1739	2171	44	121	2.29	-2.21	3.32	7.2	2.4
30	1300	440	4.16	1764	2191	43	114	2.18	-2.10	3.21	7.0	2.4
30	1300	460	4.06	1787	2210	42	108	2.08	-2.01	3.10	6.9	2.4
30	1300	480	3.96	1808	2227	42	103	1.99	-1.93	3.01	6.7	2.3
30	1300	500	3.87	1827	2243	41	97	1.91	-1.85	2.92	6.5	2.3
30	1300	520	3.79	1846	2258	41	93	1.84	-1.78	2.83	6.4	2.3
30	1300	540	3.70	1863	2272	40	89	1.77	-1.71	2.75	6.3	2.3
30	1300	560	3.63	1879	2285	40	84	1.71	-1.65	2.68	6.1	2.3
30	1300	580	3.55	1893	2297	39	81	1.65	-1.60	2.61	6.0	2.2
30	1300	600	3.48	1907	2308	39	77	1.59	-1.54	2.55	5.9	2.2
30	1400	400	4.74	1812	2290	46	137	2.50	-2.40	3.50	8.0	2.8
30	1400	420	4.63	1841	2313	45	129	2.37	-2.28	3.38	7.8	2.8
30	1400	440	4.52	1869	2334	44	122	2.26	-2.18	3.27	7.6	2.7
30	1400	460	4.41	1893	2355	43	116	2.16	-2.08	3.17	7.5	2.7
30	1400	480	4.31	1917	2374	43	110	2.07	-2.00	3.07	7.3	2.7
30	1400	500	4.22	1938	2391	42	105	1.99	-1.92	2.98	7.1	2.7
30	1400	520	4.13	1959	2408	42	100	1.91	-1.85	2.90	7.0	2.6
30	1400	540	4.04	1978	2423	41	95	1.84	-1.78	2.82	6.8	2.6
30	1400	560	3.96	1995	2438	41	91	1.77	-1.72	2.75	6.7	2.6
30	1400	580	3.88	2012	2451	40	87	1.71	-1.66	2.68	6.6	2.6
30	1400	600	3.81	2028	2464	40	83	1.66	-1.61	2.61	6.4	2.5

figure 6-66 (Sheet 19 of 21)

## Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	1500	400	5.11	1905	2426	47	146	2.58	-2.48	3.56	8.6	3.1
30	1500	420	4.99	1938	2451	45	138	2.46	-2.36	3.44	8.4	3.1
30	1500	440	4.88	1963	2475	45	130	2.34	-2.25	3.33	8.2	3.1
30	1500	460	4.77	1996	2497	45	124	2.24	-2.16	3.23	8.1	3.0
30	1500	480	4.67	2021	2517	44	117	2.15	-2.07	3.13	7.9	3.0
30	1500	500	4.57	2045	2536	43	112	2.06	-1.99	3.04	7.7	3.0
30	1500	520	4.48	2069	2554	43	107	1.98	-1.91	2.96	7.6	3.0
30	1500	540	4.39	2083	2571	42	102	1.91	-1.84	2.88	7.4	3.0
30	1500	560	4.30	2108	2587	42	97	1.84	-1.78	2.81	7.3	2.9
30	1500	580	4.22	2126	2602	41	93	1.78	-1.72	2.74	7.1	2.9
30	1500	600	4.15	2144	2616	41	89	1.72	-1.67	2.68	7.0	2.9
30	1600	400	5.48	1997	2559	48	155	2.66	-2.55	3.61	9.3	3.5
30	1600	420	5.35	2032	2586	47	146	2.54	-2.43	3.50	9.0	3.5
30	1600	440	5.24	2064	2612	46	138	2.42	-2.32	3.39	8.9	3.4
30	1600	460	5.13	2094	2635	46	131	2.32	-2.23	3.29	8.7	3.4
30	1600	480	5.02	2122	2658	45	125	2.22	-2.14	3.19	8.5	3.4
30	1600	500	4.92	2148	2678	44	119	2.13	-2.05	3.11	8.3	3.4
30	1600	520	4.83	2172	2698	44	114	2.05	-1.98	3.02	8.2	3.3
30	1600	540	4.74	2195	2716	43	109	1.98	-1.91	2.95	8.0	3.3
30	1600	560	4.65	2216	2734	43	104	1.91	-1.84	2.87	7.9	3.3
30	1600	580	4.57	2237	2750	42	100	1.85	-1.78	2.81	7.7	3.3
30	1600	600	4.49	2255	2765	42	96	1.79	-1.73	2.74	7.6	3.2
30	1700	400	5.84	2085	2690	49	163	2.74	-2.63	3.67	9.9	3.9
30	1700	420	5.72	2122	2719	48	154	2.62	-2.51	3.55	9.7	3.8
30	1700	440	5.60	2156	2746	48	147	2.50	-2.40	3.45	9.5	3.8
30	1700	460	5.49	2188	2771	47	139	2.39	-2.30	3.35	9.3	3.8
30	1700	480	5.39	2219	2795	46	133	2.30	-2.21	3.25	9.1	3.8
30	1700	500	5.28	2247	2817	46	127	2.21	-2.12	3.17	8.9	3.7
30	1700	520	5.18	2273	2838	45	121	2.13	-2.04	3.08	8.8	3.7
30	1700	540	5.09	2298	2858	45	116	2.05	-1.97	3.01	8.6	3.7
30	1700	560	5.00	2321	2877	44	111	1.98	-1.91	2.94	8.4	3.7
30	1700	580	4.91	2343	2895	44	106	1.92	-1.85	2.87	8.3	3.6
30	1700	600	4.83	2363	2911	43	102	1.86	-1.79	2.80	8.2	3.6
30	1800	400	6.21	2168	2818	50	172	2.82	-2.70	3.72	10.5	4.2
30	1800	420	6.08	2208	2849	50	163	2.69	-2.58	3.61	10.3	4.2
30	1800	440	5.96	2245	2877	49	155	2.57	-2.47	3.50	10.1	4.2
30	1800	460	5.85	2279	2904	48	147	2.47	-2.37	3.40	9.9	4.2
30	1800	480	5.74	2311	2930	47	140	2.37	-2.27	3.31	9.7	4.1
30	1800	500	5.64	2342	2953	47	134	2.28	-2.19	3.22	9.5	4.1
30	1800	520	5.54	2370	2976	46	128	2.20	-2.11	3.14	9.4	4.1
30	1800	540	5.44	2396	2997	46	123	2.12	-2.04	3.07	9.2	4.1
30	1800	560	5.35	2421	3017	45	118	2.05	-1.97	3.00	9.0	4.0
30	1800	580	5.26	2445	3036	45	113	1.98	-1.91	2.93	8.9	4.0
30	1800	600	5.18	2467	3054	44	109	1.92	-1.85	2.86	8.7	4.0
30	1900	400	6.57	2249	2944	52	181	2.90	-2.77	3.77	11.1	4.6
30	1900	420	6.45	2291	2976	51	171	2.77	-2.65	3.66	10.9	4.6
30	1900	440	6.32	2330	3006	50	163	2.65	-2.54	3.55	10.7	4.6
30	1900	460	6.21	2366	3035	49	155	2.54	-2.43	3.46	10.5	4.6
30	1900	480	6.10	2401	3062	49	148	2.44	-2.34	3.37	10.3	4.5
30	1900	500	5.99	2433	3087	48	142	2.35	-2.25	3.28	10.1	4.5
30	1900	520	5.89	2463	3111	47	136	2.27	-2.18	3.20	10.0	4.5
30	1900	540	5.79	2491	3133	47	130	2.19	-2.10	3.12	9.8	4.5
30	1900	560	5.70	2518	3155	46	125	2.12	-2.03	3.05	9.6	4.4
30	1900	580	5.61	2544	3175	46	120	2.05	-1.97	2.99	9.5	4.4
30	1900	600	5.53	2567	3194	45	116	1.99	-1.91	2.92	9.3	4.4
30	2000	400	6.94	2326	3067	53	189	2.98	-2.85	3.82	11.7	5.0
30	2000	420	6.81	2370	3101	52	180	2.84	-2.72	3.71	11.5	5.0
30	2000	440	6.69	2411	3133	51	171	2.72	-2.61	3.61	11.3	5.0
30	2000	460	6.57	2450	3163	51	163	2.61	-2.50	3.51	11.1	5.0
30	2000	480	6.46	2486	3191	50	156	2.51	-2.41	3.42	10.9	4.9
30	2000	500	6.35	2521	3218	49	149	2.42	-2.32	3.33	10.7	4.9
30	2000	520	6.25	2553	3243	49	143	2.34	-2.24	3.26	10.6	4.9
30	2000	540	6.15	2583	3267	48	137	2.26	-2.17	3.18	10.4	4.9
30	2000	560	6.05	2611	3289	47	132	2.18	-2.10	3.11	10.2	4.8
30	2000	580	5.96	2638	3311	47	127	2.12	-2.03	3.04	10.1	4.8
30	2000	600	5.88	2664	3331	46	122	2.05	-1.97	2.98	9.9	4.8

**Figure 6-66 (Sheet 20 of 21)**

# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	2100	400	7.30	2400	3189	54	193	3.05	-2.91	3.87	12.3	5.4
30	2100	420	7.17	2446	3224	53	188	2.92	-2.79	3.76	12.1	5.4
30	2100	440	7.05	2490	3257	52	179	2.80	-2.67	3.66	11.9	5.4
30	2100	460	6.93	2531	3288	52	171	2.68	-2.57	3.56	11.7	5.4
30	2100	480	6.82	2563	3318	51	164	2.58	-2.47	3.47	11.5	5.3
30	2100	500	6.71	2605	3346	50	157	2.49	-2.38	3.39	11.3	5.3
30	2100	520	6.60	2639	3372	50	151	2.40	-2.30	3.31	11.2	5.3
30	2100	540	6.50	2671	3398	49	145	2.32	-2.23	3.23	11.0	5.3
30	2100	560	6.41	2701	3421	49	139	2.25	-2.16	3.16	10.8	5.3
30	2100	580	6.32	2730	3444	48	134	2.18	-2.09	3.10	10.7	5.2
30	2100	600	6.23	2757	3465	48	129	2.12	-2.03	3.04	10.5	5.2
30	2200	400	7.66	2471	3308	55	206	3.13	-2.98	3.91	13.0	5.8
30	2200	420	7.53	2519	3345	54	197	2.99	-2.86	3.81	12.7	5.8
30	2200	440	7.41	2565	3379	54	188	2.87	-2.74	3.70	12.5	5.8
30	2200	460	7.29	2608	3412	53	179	2.76	-2.63	3.61	12.3	5.8
30	2200	480	7.17	2648	3443	52	172	2.65	-2.54	3.52	12.1	5.8
30	2200	500	7.06	2686	3472	51	165	2.56	-2.45	3.44	11.9	5.7
30	2200	520	6.96	2722	3500	51	158	2.47	-2.37	3.36	11.8	5.7
30	2200	540	6.86	2755	3526	50	152	2.39	-2.29	3.29	11.6	5.7
30	2200	560	6.76	2787	3551	50	147	2.32	-2.22	3.22	11.4	5.7
30	2200	580	6.67	2817	3575	49	141	2.25	-2.15	3.15	11.3	5.7
30	2200	600	6.58	2846	3597	49	136	2.18	-2.09	3.09	11.1	5.6
30	2300	400	8.02	2539	3426	56	215	3.20	-3.05	3.96	13.6	6.2
30	2300	420	7.89	2590	3464	55	205	3.06	-2.92	3.85	13.3	6.2
30	2300	440	7.77	2637	3499	55	196	2.94	-2.80	3.75	13.1	6.2
30	2300	460	7.65	2682	3533	54	187	2.82	-2.70	3.66	12.9	6.2
30	2300	480	7.53	2724	3565	53	180	2.72	-2.60	3.57	12.7	6.2
30	2300	500	7.42	2764	3596	53	172	2.62	-2.51	3.49	12.5	6.2
30	2300	520	7.32	2802	3625	52	166	2.54	-2.43	3.41	12.4	6.1
30	2300	540	7.21	2837	3652	51	160	2.46	-2.35	3.34	12.2	6.1
30	2300	560	7.12	2870	3678	51	154	2.38	-2.28	3.27	12.0	6.1
30	2300	580	7.02	2902	3703	50	148	2.31	-2.21	3.20	11.9	6.1
30	2300	600	6.93	2932	3727	50	143	2.24	-2.15	3.14	11.7	6.1
30	2400	400	8.38	2605	3542	57	223	3.27	-3.11	4.00	14.2	6.6
30	2400	420	8.25	2658	3581	57	213	3.13	-2.99	3.89	13.9	6.6
30	2400	440	8.12	2707	3618	56	204	3.01	-2.87	3.79	13.7	6.6
30	2400	460	8.00	2754	3653	55	195	2.89	-2.76	3.70	13.5	6.6
30	2400	480	7.88	2798	3686	54	187	2.79	-2.66	3.62	13.3	6.6
30	2400	500	7.78	2839	3718	54	180	2.69	-2.57	3.54	13.1	6.6
30	2400	520	7.67	2878	3748	53	173	2.60	-2.49	3.46	13.0	6.6
30	2400	540	7.57	2915	3776	53	167	2.52	-2.41	3.39	12.8	6.6
30	2400	560	7.47	2950	3803	52	161	2.44	-2.34	3.32	12.6	6.5
30	2400	580	7.38	2983	3829	51	156	2.37	-2.27	3.26	12.5	6.5
30	2400	600	7.29	3015	3854	51	151	2.31	-2.21	3.19	12.3	6.5
30	2500	400	8.74	2663	3656	58	232	3.33	-3.18	4.04	14.8	7.1
30	2500	420	8.61	2723	3696	58	221	3.20	-3.05	3.94	14.5	7.1
30	2500	440	8.48	2774	3734	57	212	3.07	-2.93	3.84	14.3	7.1
30	2500	460	8.36	2823	3771	56	203	2.96	-2.82	3.75	14.1	7.0
30	2500	480	8.24	2868	3805	55	195	2.85	-2.72	3.66	13.9	7.0
30	2500	500	8.13	2911	3838	55	188	2.76	-2.63	3.58	13.7	7.0
30	2500	520	8.03	2952	3868	54	181	2.67	-2.55	3.51	13.6	7.0
30	2500	540	7.92	2991	3898	54	175	2.58	-2.47	3.43	13.4	7.0
30	2500	560	7.82	3027	3926	53	169	2.51	-2.40	3.37	13.2	7.0
30	2500	580	7.73	3062	3953	53	163	2.43	-2.33	3.30	13.1	7.0
30	2500	600	7.64	3095	3978	52	158	2.37	-2.27	3.24	12.9	7.0
30	2600	400	9.10	2729	3769	59	240	3.40	-3.24	4.08	15.4	7.5
30	2600	420	8.96	2785	3810	59	230	3.26	-3.11	3.97	15.1	7.5
30	2600	440	8.84	2839	3850	58	220	3.14	-2.99	3.88	14.9	7.5
30	2600	460	8.72	2889	3887	57	211	3.02	-2.88	3.79	14.7	7.5
30	2600	480	8.60	2936	3922	57	203	2.92	-2.78	3.70	14.5	7.5
30	2600	500	8.49	2981	3956	56	196	2.82	-2.69	3.63	14.3	7.5
30	2600	520	8.38	3023	3988	55	189	2.73	-2.61	3.55	14.2	7.4
30	2600	540	8.28	3063	4018	55	182	2.65	-2.53	3.48	14.0	7.4
30	2600	560	8.18	3101	4047	54	176	2.57	-2.46	3.41	13.8	7.4
30	2600	580	8.08	3137	4075	54	170	2.50	-2.39	3.35	13.7	7.4
30	2600	600	7.99	3172	4101	53	165	2.43	-2.32	3.29	13.5	7.4

Figure 6-66 (Sheet 21 of 21)

**BALLISTIC TABLE - MK82 LOW DRAG  
(CONICAL FIN) BOMB**

The full ballistic tables for MK82 Low Drag Bombs released from the RPK10 front and rear stations are contained in ARDU TI 588 and TI 677.

Because the RPK10 imparts a sideways velocity to the bomb during ejection, an allowance of 10 mils laterally must be taken into consideration during calculations, ie a bomb dropped from the RPK10 impacts 10 mils laterally from the aircraft track.

**Front Station**

Figure 6-67 can be used for sighting calculations for MK82 Low Drag bombs dropped from the PM-3 on the RPK10 front station at all speeds. The required aim-off angle for the RPK10 front station is 2 mils to 4 mils less than that required for the PM-3, however, this inaccuracy is acceptable.

**Rear Station**

Figure 6-67 can be used for sighting calculations for MK82 low drag bombs released from the rear station of the RPK10 up to 540 kn TAS; the table has the same degree of inaccuracy mentioned in the above paragraph and again the inaccuracies are acceptable. For release speeds higher than 540 kn TAS Figure 6-67 becomes progressively more inaccurate up to a maximum error of 10 mils. Therefore, Figure 6-69 should be used for sighting calculations for release speeds higher than 540 kn TAS.

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	200	400	3.32	2219	2228	10	93	0.24	-0.23	2.52	5.6	0.1
0	200	420	3.32	2329	2338	9	88	0.22	-0.21	2.40	5.6	0.1
0	200	440	3.32	2439	2448	9	84	0.20	-0.19	2.29	5.6	0.1
0	200	460	3.32	2550	2557	8	81	0.18	-0.17	2.19	5.6	0.1
0	200	480	3.32	2660	2667	8	77	0.17	-0.16	2.10	5.6	0.1
0	200	500	3.32	2769	2777	8	74	0.15	-0.15	2.02	5.6	0.1
0	200	520	3.32	2879	2886	8	71	0.14	-0.14	1.95	5.6	0.1
0	200	540	3.32	2989	2996	7	69	0.13	-0.13	1.97	5.6	0.1
0	200	560	3.32	3099	3105	7	66	0.12	-0.12	1.81	5.6	0.1
0	200	580	3.32	3209	3215	7	64	0.11	-0.11	1.75	5.6	0.1
0	200	600	3.33	3318	3324	7	62	0.11	-0.10	1.69	5.6	0.1
0	300	400	4.12	2745	2762	12	111	0.29	-0.27	2.52	7.0	0.1
0	300	420	4.12	2862	2897	11	106	0.26	-0.25	2.40	7.0	0.1
0	300	440	4.12	3018	3032	11	101	0.24	-0.23	2.29	7.0	0.1
0	300	460	4.12	3153	3168	10	97	0.22	-0.21	2.20	7.0	0.1
0	300	480	4.12	3289	3303	10	93	0.20	-0.19	2.11	7.0	0.1
0	300	500	4.12	3425	3438	10	89	0.18	-0.18	2.03	7.0	0.1
0	300	520	4.12	3561	3573	9	86	0.17	-0.16	1.95	7.0	0.1
0	300	540	4.12	3696	3708	9	83	0.16	-0.15	1.88	7.0	0.1
0	300	560	4.12	3831	3843	9	80	0.15	-0.14	1.81	7.0	0.1
0	300	580	4.13	3967	3978	8	77	0.14	-0.13	1.75	7.0	0.1
0	300	600	4.13	4101	4112	8	74	0.13	-0.12	1.70	7.0	0.1
0	400	400	4.79	3188	3213	14	127	0.33	-0.31	2.52	8.1	0.1
0	400	420	4.79	3346	3370	13	121	0.30	-0.28	2.40	8.1	0.1
0	400	440	4.79	3504	3526	12	115	0.27	-0.26	2.30	8.1	0.1
0	400	460	4.79	3661	3683	12	111	0.25	-0.24	2.20	8.1	0.1
0	400	480	4.80	3819	3839	11	106	0.23	-0.22	2.11	8.1	0.1
0	400	500	4.80	3976	3996	11	102	0.21	-0.20	2.03	8.1	0.2
0	400	520	4.80	4133	4152	11	98	0.19	-0.19	1.95	8.1	0.2
0	400	540	4.80	4290	4308	10	94	0.18	-0.17	1.88	8.1	0.2
0	400	560	4.80	4447	4465	10	91	0.17	-0.16	1.82	8.1	0.2
0	400	580	4.80	4603	4621	10	88	0.16	-0.15	1.76	8.1	0.2
0	400	600	4.80	4759	4776	9	85	0.15	-0.14	1.70	8.1	0.2
0	500	400	5.38	3577	3612	15	141	0.36	-0.34	2.52	9.1	0.2
0	500	420	5.39	3754	3787	15	134	0.33	-0.31	2.40	9.1	0.2
0	500	440	5.39	3931	3962	14	128	0.30	-0.29	2.30	9.1	0.2
0	500	460	5.39	4107	4138	13	123	0.28	-0.26	2.20	9.1	0.2
0	500	480	5.39	4284	4313	13	118	0.25	-0.24	2.11	9.1	0.2
0	500	500	5.39	4460	4488	12	113	0.23	-0.22	2.03	9.1	0.2
0	500	520	5.39	4636	4663	12	109	0.22	-0.21	1.95	9.1	0.2
0	500	540	5.40	4811	4837	11	105	0.20	-0.19	1.88	9.1	0.2
0	500	560	5.40	4987	5012	11	101	0.19	-0.18	1.82	9.1	0.2
0	500	580	5.40	5162	5187	11	98	0.17	-0.17	1.76	9.1	0.2
0	500	600	5.40	5337	5361	10	95	0.16	-0.16	1.70	9.1	0.2
0	600	400	5.92	3928	3974	17	153	0.39	-0.38	2.52	10.0	0.2
0	600	420	5.92	4122	4166	16	146	0.36	-0.34	2.40	10.0	0.2
0	600	440	5.93	4316	4358	15	140	0.33	-0.31	2.30	10.0	0.2
0	600	460	5.93	4510	4549	15	134	0.30	-0.29	2.20	10.0	0.2
0	600	480	5.93	4703	4741	14	128	0.28	-0.26	2.11	10.0	0.2
0	600	500	5.93	4896	4933	13	123	0.26	-0.24	2.03	10.0	0.2
0	600	520	5.93	5089	5124	13	119	0.24	-0.23	1.96	10.0	0.2
0	600	540	5.94	5282	5316	13	114	0.22	-0.21	1.89	10.0	0.3
0	600	560	5.94	5474	5507	12	110	0.20	-0.20	1.82	10.0	0.3
0	600	580	5.94	5666	5698	12	107	0.19	-0.18	1.76	10.0	0.3
0	600	600	5.94	5858	5889	11	103	0.18	-0.17	1.71	10.0	0.3
0	700	400	6.42	4251	4308	18	165	0.42	-0.40	2.52	10.8	0.2
0	700	420	6.42	4460	4515	17	157	0.39	-0.37	2.40	10.9	0.2
0	700	440	6.42	4670	4722	16	150	0.35	-0.34	2.30	10.9	0.2
0	700	460	6.42	4879	4929	16	144	0.32	-0.31	2.20	10.9	0.3
0	700	480	6.43	5088	5136	15	138	0.30	-0.29	2.11	10.9	0.3
0	700	500	6.43	5297	5343	15	133	0.27	-0.26	2.03	10.9	0.3
0	700	520	6.43	5505	5549	14	128	0.25	-0.24	1.96	10.9	0.3
0	700	540	6.43	5713	5756	14	123	0.24	-0.23	1.89	10.9	0.3
0	700	560	6.44	5921	5962	13	119	0.22	-0.21	1.82	10.9	0.3
0	700	580	6.44	6129	6168	13	115	0.21	-0.20	1.76	10.9	0.3
0	700	600	6.44	6335	6374	12	111	0.19	-0.19	1.71	10.9	0.3

Figure 6-67 (Sheet 1 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	800	400	6.88	4550	4620	19	176	0.45	-0.43	2.52	11.6	0.3
0	800	420	6.88	4774	4841	18	168	0.41	-0.39	2.40	11.6	0.3
0	800	440	6.89	4998	5062	17	160	0.38	-0.36	2.30	11.6	0.3
0	800	460	6.89	5222	5283	17	153	0.34	-0.33	2.20	11.6	0.3
0	800	480	6.89	5445	5504	16	147	0.32	-0.30	2.12	11.6	0.3
0	800	500	6.89	5668	5725	16	141	0.29	-0.28	2.03	11.6	0.3
0	800	520	6.90	5891	5945	15	135	0.27	-0.26	1.96	11.7	0.3
0	800	540	6.90	6114	6166	14	131	0.25	-0.24	1.89	11.7	0.3
0	800	560	6.90	6336	6386	14	127	0.23	-0.23	1.83	11.7	0.3
0	800	580	6.90	6558	6606	14	122	0.22	-0.21	1.77	11.7	0.4
0	800	600	6.91	6779	6826	13	118	0.21	-0.20	1.71	11.7	0.4
0	900	400	7.31	4831	4914	20	186	0.48	-0.45	2.52	12.4	0.3
0	900	420	7.32	5069	5148	19	177	0.43	-0.41	2.40	12.4	0.3
0	900	440	7.32	5306	5382	19	169	0.40	-0.38	2.30	12.4	0.3
0	900	460	7.32	5544	5616	18	162	0.36	-0.35	2.20	12.4	0.3
0	900	480	7.33	5780	5850	17	156	0.34	-0.32	2.12	12.4	0.3
0	900	500	7.33	6017	6084	16	150	0.31	-0.30	2.04	12.4	0.3
0	900	520	7.33	6253	6318	16	144	0.29	-0.28	1.96	12.4	0.4
0	900	540	7.33	6489	6551	15	139	0.27	-0.26	1.89	12.4	0.4
0	900	560	7.34	6725	6785	15	134	0.25	-0.24	1.83	12.4	0.4
0	900	580	7.34	6960	7018	14	130	0.23	-0.22	1.77	12.4	0.4
0	900	600	7.34	7194	7250	14	125	0.22	-0.21	1.71	12.4	0.4
0	1000	400	7.73	5096	5193	21	195	0.50	-0.48	2.51	13.1	0.3
0	1000	420	7.73	5347	5439	20	186	0.46	-0.43	2.40	13.1	0.3
0	1000	440	7.73	5597	5686	19	178	0.42	-0.40	2.30	13.1	0.3
0	1000	460	7.73	5847	5932	19	171	0.38	-0.37	2.20	13.1	0.4
0	1000	480	7.74	6097	6178	18	164	0.35	-0.34	2.12	13.1	0.4
0	1000	500	7.74	6346	6424	17	157	0.33	-0.31	2.04	13.1	0.4
0	1000	520	7.74	6595	6670	17	152	0.30	-0.29	1.96	13.1	0.4
0	1000	540	7.75	6843	6916	16	146	0.28	-0.27	1.89	13.1	0.4
0	1000	560	7.75	7092	7162	16	141	0.26	-0.25	1.83	13.1	0.4
0	1000	580	7.75	7339	7407	15	136	0.24	-0.24	1.77	13.1	0.4
0	1000	600	7.76	7586	7652	15	132	0.23	-0.22	1.71	13.1	0.5
0	1500	400	9.53	6253	6430	26	237	0.60	-0.57	2.50	16.1	0.5
0	1500	420	9.53	6559	6729	25	226	0.55	-0.52	2.39	16.1	0.5
0	1500	440	9.54	6865	7027	24	216	0.50	-0.48	2.29	16.1	0.5
0	1500	460	9.54	7171	7326	23	207	0.46	-0.44	2.20	16.1	0.5
0	1500	480	9.55	7476	7625	22	199	0.43	-0.41	2.12	16.1	0.6
0	1500	500	9.55	7780	7924	21	191	0.40	-0.38	2.04	16.1	0.6
0	1500	520	9.56	8084	8222	20	184	0.37	-0.35	1.96	16.1	0.6
0	1500	540	9.56	8388	8521	20	178	0.34	-0.33	1.90	16.2	0.6
0	1500	560	9.56	8690	8819	19	172	0.32	-0.31	1.83	16.2	0.6
0	1500	580	9.57	8992	9117	19	166	0.30	-0.29	1.77	16.2	0.7
0	1500	600	9.57	9293	9413	18	161	0.28	-0.27	1.72	16.2	0.7
0	2000	400	11.05	7223	7494	29	271	0.68	-0.65	2.49	18.7	0.6
0	2000	420	11.06	7576	7835	28	259	0.63	-0.60	2.39	18.7	0.7
0	2000	440	11.07	7928	8177	27	248	0.57	-0.55	2.29	18.7	0.7
0	2000	460	11.07	8280	8518	26	238	0.53	-0.51	2.20	18.7	0.7
0	2000	480	11.08	8631	8860	25	229	0.49	-0.47	2.11	18.7	0.7
0	2000	500	11.08	8981	9201	24	220	0.45	-0.44	2.04	18.7	0.8
0	2000	520	11.09	9331	9543	23	212	0.42	-0.41	1.96	18.7	0.8
0	2000	540	11.10	9680	9894	23	205	0.39	-0.38	1.90	18.8	0.8
0	2000	560	11.10	10028	10225	22	198	0.37	-0.35	1.83	18.8	0.9
0	2000	580	11.11	10375	10566	21	191	0.34	-0.33	1.78	18.8	0.9
0	2000	600	11.11	10720	10905	21	185	0.32	-0.31	1.72	18.8	0.9
0	2500	400	12.40	8073	8451	32	301	0.75	-0.72	2.48	21.0	0.8
0	2500	420	12.41	8467	8828	31	288	0.69	-0.66	2.38	21.0	0.8
0	2500	440	12.42	8860	9206	30	276	0.64	-0.61	2.28	21.0	0.8
0	2500	460	12.42	9252	9584	29	265	0.59	-0.56	2.19	21.0	0.9
0	2500	480	12.43	9643	9962	28	255	0.54	-0.52	2.11	21.0	0.9
0	2500	500	12.44	10034	10340	27	245	0.50	-0.48	2.03	21.0	1.0
0	2500	520	12.45	10423	10719	26	236	0.47	-0.45	1.96	21.0	1.0
0	2500	540	12.45	10812	11097	25	228	0.44	-0.42	1.90	21.0	1.0
0	2500	560	12.46	11199	11475	24	220	0.41	-0.39	1.84	21.1	1.1
0	2500	580	12.47	11586	11853	24	213	0.38	-0.37	1.78	21.1	1.1
0	2500	600	12.47	11969	12227	23	207	0.36	-0.35	1.72	21.1	1.1

Figure 6-67 (Sheet 2 of 20)



# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	200	400	1.37	906	928	14	48	0.61	-0.60	2.49	2.3	0.0
10	200	420	1.32	920	941	14	45	0.57	-0.56	2.38	2.2	0.0
10	200	440	1.28	932	953	14	42	0.53	-0.53	2.27	2.2	0.0
10	200	460	1.24	943	964	13	40	0.50	-0.49	2.17	2.1	0.0
10	200	480	1.20	953	974	13	38	0.47	-0.47	2.08	2.0	0.0
10	200	500	1.16	963	983	13	36	0.45	-0.44	2.00	2.0	0.0
10	200	520	1.13	971	992	13	34	0.43	-0.42	1.92	1.9	0.0
10	200	540	1.10	979	1000	13	32	0.40	-0.40	1.85	1.9	0.0
10	200	560	1.07	987	1007	12	30	0.39	-0.38	1.79	1.8	0.0
10	200	580	1.04	994	1014	12	29	0.37	-0.37	1.73	1.8	0.0
10	200	600	1.01	1000	1020	12	28	0.35	-0.35	1.67	1.7	0.0
10	300	400	1.94	1279	1314	16	60	0.66	-0.64	2.49	3.3	0.0
10	300	420	1.88	1302	1336	15	56	0.61	-0.60	2.38	3.2	0.0
10	300	440	1.82	1323	1357	15	52	0.57	-0.56	2.27	3.1	0.0
10	300	460	1.77	1343	1376	15	49	0.54	-0.53	2.17	3.0	0.0
10	300	480	1.72	1361	1394	14	46	0.51	-0.50	2.08	2.9	0.0
10	300	500	1.67	1378	1411	14	43	0.48	-0.47	2.00	2.8	0.0
10	300	520	1.62	1394	1426	14	41	0.45	-0.45	1.93	2.7	0.0
10	300	540	1.58	1409	1440	14	39	0.43	-0.43	1.85	2.7	0.0
10	300	560	1.54	1422	1453	13	37	0.41	-0.41	1.79	2.6	0.0
10	300	580	1.50	1435	1466	13	35	0.39	-0.39	1.73	2.5	0.0
10	300	600	1.46	1447	1477	13	33	0.37	-0.37	1.67	2.5	0.0
10	400	400	2.46	1618	1667	17	71	0.70	-0.68	2.49	4.2	0.0
10	400	420	2.39	1652	1699	17	66	0.65	-0.64	2.37	4.0	0.0
10	400	440	2.32	1683	1729	16	62	0.61	-0.60	2.27	3.9	0.0
10	400	460	2.26	1711	1757	16	58	0.57	-0.56	2.17	3.8	0.0
10	400	480	2.20	1738	1784	15	55	0.54	-0.53	2.08	3.7	0.0
10	400	500	2.14	1763	1808	15	52	0.50	-0.50	2.00	3.6	0.0
10	400	520	2.09	1787	1831	15	49	0.48	-0.47	1.93	3.5	0.0
10	400	540	2.03	1809	1852	14	46	0.45	-0.45	1.86	3.4	0.0
10	400	560	1.98	1829	1872	14	44	0.43	-0.43	1.79	3.4	0.0
10	400	580	1.94	1848	1891	14	41	0.41	-0.41	1.73	3.3	0.0
10	400	600	1.89	1866	1909	14	39	0.39	-0.39	1.67	3.2	0.0
10	500	400	2.94	1932	1995	18	82	0.73	-0.72	2.49	5.0	0.1
10	500	420	2.86	1975	2037	18	76	0.68	-0.67	2.37	4.8	0.1
10	500	440	2.79	2016	2077	17	71	0.64	-0.62	2.27	4.7	0.1
10	500	460	2.72	2054	2114	17	67	0.60	-0.59	2.17	4.6	0.1
10	500	480	2.65	2090	2149	16	63	0.56	-0.55	2.08	4.5	0.1
10	500	500	2.58	2123	2181	16	59	0.53	-0.52	2.00	4.4	0.1
10	500	520	2.52	2155	2212	16	56	0.50	-0.49	1.93	4.3	0.1
10	500	540	2.46	2184	2241	15	53	0.47	-0.47	1.86	4.2	0.1
10	500	560	2.40	2212	2268	15	50	0.45	-0.44	1.79	4.1	0.0
10	500	580	2.35	2238	2294	15	48	0.43	-0.42	1.73	4.0	0.0
10	500	600	2.30	2263	2318	15	45	0.41	-0.40	1.67	3.9	0.0
10	600	400	3.39	2224	2303	19	92	0.77	-0.75	2.48	5.7	0.1
10	600	420	3.30	2277	2355	19	86	0.71	-0.70	2.37	5.6	0.1
10	600	440	3.22	2328	2404	18	80	0.66	-0.65	2.26	5.4	0.1
10	600	460	3.15	2376	2450	18	75	0.62	-0.61	2.17	5.3	0.1
10	600	480	3.07	2420	2494	17	71	0.58	-0.57	2.08	5.2	0.1
10	600	500	3.00	2463	2535	17	67	0.55	-0.54	2.00	5.1	0.1
10	600	520	2.93	2502	2573	16	63	0.52	-0.51	1.93	5.0	0.1
10	600	540	2.87	2540	2610	16	60	0.49	-0.48	1.86	4.8	0.1
10	600	560	2.80	2575	2644	16	56	0.47	-0.46	1.79	4.7	0.1
10	600	580	2.74	2609	2677	15	54	0.44	-0.44	1.73	4.6	0.1
10	600	600	2.68	2640	2707	15	51	0.42	-0.42	1.67	4.5	0.1
10	700	400	3.81	2499	2595	21	101	0.80	-0.78	2.48	6.4	0.1
10	700	420	3.72	2562	2656	20	94	0.74	-0.72	2.37	6.3	0.1
10	700	440	3.64	2623	2715	19	88	0.69	-0.68	2.26	6.1	0.1
10	700	460	3.55	2680	2770	19	83	0.65	-0.63	2.17	6.0	0.1
10	700	480	3.47	2733	2822	18	78	0.61	-0.59	2.08	5.9	0.1
10	700	500	3.40	2784	2871	18	74	0.57	-0.56	2.00	5.7	0.1
10	700	520	3.32	2832	2918	17	70	0.54	-0.53	1.93	5.6	0.1
10	700	540	3.25	2878	2962	17	66	0.51	-0.50	1.86	5.5	0.1
10	700	560	3.18	2921	3004	16	63	0.48	-0.48	1.79	5.4	0.1
10	700	580	3.12	2962	3043	16	59	0.46	-0.45	1.73	5.3	0.1
10	700	600	3.05	3000	3081	16	56	0.44	-0.43	1.68	5.2	0.1

Figure 6-67 (Sheet 3 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	800	400	4.21	2759	2872	22	110	0.82	-0.90	2.48	7.1	0.1
10	800	420	4.12	2833	2943	21	103	0.76	-0.75	2.36	7.0	0.1
10	800	440	4.03	2902	3011	20	96	0.71	-0.70	2.26	6.8	0.1
10	800	460	3.94	2969	3075	20	91	0.67	-0.65	2.17	6.7	0.1
10	800	480	3.86	3031	3135	19	85	0.63	-0.61	2.08	6.5	0.1
10	800	500	3.78	3091	3193	18	81	0.59	-0.58	2.00	6.4	0.1
10	800	520	3.70	3147	3247	18	76	0.56	-0.55	1.93	6.3	0.1
10	800	540	3.62	3201	3299	18	72	0.53	-0.52	1.86	6.1	0.1
10	800	560	3.55	3252	3349	17	68	0.50	-0.49	1.79	6.0	0.1
10	800	580	3.48	3300	3395	17	65	0.47	-0.47	1.73	5.9	0.1
10	800	600	3.41	3345	3440	16	62	0.45	-0.44	1.68	5.8	0.1
10	900	400	4.59	3006	3138	22	118	0.85	-0.93	2.47	7.8	0.1
10	900	420	4.50	3090	3218	22	111	0.79	-0.77	2.36	7.6	0.1
10	900	440	4.40	3169	3294	21	104	0.73	-0.72	2.26	7.4	0.1
10	900	460	4.31	3244	3367	20	98	0.69	-0.67	2.17	7.3	0.1
10	900	480	4.23	3316	3436	20	92	0.64	-0.63	2.08	7.1	0.1
10	900	500	4.14	3384	3502	19	87	0.61	-0.59	2.00	7.0	0.1
10	900	520	4.06	3449	3564	19	82	0.57	-0.56	1.92	6.9	0.1
10	900	540	3.98	3510	3624	18	78	0.54	-0.53	1.86	6.7	0.1
10	900	560	3.90	3569	3680	18	74	0.51	-0.50	1.79	6.6	0.1
10	900	580	3.83	3624	3734	17	70	0.49	-0.48	1.73	6.5	0.1
10	900	600	3.76	3677	3786	17	67	0.46	-0.46	1.68	6.3	0.1
10	1000	400	4.96	3243	3394	23	127	0.87	-0.95	2.47	8.4	0.2
10	1000	420	4.86	3336	3483	23	119	0.81	-0.79	2.36	8.2	0.1
10	1000	440	4.77	3424	3567	22	111	0.75	-0.74	2.26	8.1	0.1
10	1000	460	4.67	3509	3648	21	105	0.71	-0.69	2.16	7.9	0.1
10	1000	480	4.58	3589	3726	20	99	0.66	-0.65	2.08	7.7	0.1
10	1000	500	4.49	3665	3799	20	93	0.62	-0.61	2.00	7.6	0.1
10	1000	520	4.41	3738	3870	19	88	0.59	-0.58	1.92	7.4	0.1
10	1000	540	4.32	3806	3937	19	84	0.55	-0.55	1.86	7.3	0.1
10	1000	560	4.24	3874	4001	18	80	0.53	-0.52	1.79	7.2	0.1
10	1000	580	4.16	3937	4062	18	76	0.50	-0.49	1.73	7.0	0.1
10	1000	600	4.09	3997	4120	18	72	0.48	-0.47	1.68	6.9	0.1
10	1500	400	6.61	4300	4555	27	163	0.97	-0.95	2.45	11.2	0.3
10	1500	420	6.50	4437	4684	26	153	0.90	-0.88	2.35	11.0	0.3
10	1500	440	6.39	4569	4809	25	144	0.84	-0.82	2.25	10.8	0.3
10	1500	460	6.29	4695	4929	25	136	0.79	-0.77	2.16	10.6	0.3
10	1500	480	6.18	4817	5045	24	129	0.74	-0.72	2.07	10.5	0.3
10	1500	500	6.08	4933	5156	23	122	0.69	-0.68	1.99	10.3	0.3
10	1500	520	5.98	5045	5264	22	116	0.65	-0.64	1.92	10.1	0.3
10	1500	540	5.89	5153	5367	22	110	0.62	-0.60	1.85	10.0	0.3
10	1500	560	5.79	5257	5466	21	105	0.58	-0.57	1.79	9.8	0.3
10	1500	580	5.70	5356	5562	21	100	0.55	-0.54	1.73	9.6	0.3
10	1500	600	5.61	5451	5653	20	95	0.53	-0.52	1.68	9.5	0.3
10	2000	400	8.04	5209	5580	30	193	1.05	-1.02	2.44	13.6	0.4
10	2000	420	7.93	5386	5745	29	182	0.98	-0.95	2.33	13.4	0.4
10	2000	440	7.81	5556	5905	28	172	0.91	-0.89	2.23	13.2	0.4
10	2000	460	7.70	5721	6060	27	163	0.85	-0.83	2.15	13.0	0.4
10	2000	480	7.59	5880	6211	27	154	0.80	-0.78	2.06	12.8	0.4
10	2000	500	7.48	6033	6356	26	147	0.75	-0.73	1.99	12.6	0.4
10	2000	520	7.37	6182	6497	25	139	0.71	-0.69	1.92	12.5	0.4
10	2000	540	7.27	6325	6633	24	133	0.67	-0.65	1.85	12.3	0.4
10	2000	560	7.16	6463	6765	24	127	0.63	-0.62	1.79	12.1	0.4
10	2000	580	7.06	6596	6893	23	121	0.60	-0.59	1.73	11.9	0.4
10	2000	600	6.97	6724	7015	23	115	0.57	-0.56	1.68	11.8	0.4
10	2500	400	9.33	6017	6515	33	221	1.12	-1.09	2.42	15.8	0.5
10	2500	420	9.20	6229	6712	32	208	1.04	-1.01	2.32	15.6	0.5
10	2500	440	9.08	6435	6904	31	197	0.97	-0.94	2.22	15.3	0.5
10	2500	460	8.96	6635	7091	30	197	0.91	-0.88	2.14	15.1	0.5
10	2500	480	8.85	6829	7272	29	177	0.85	-0.83	2.06	15.0	0.5
10	2500	500	8.73	7016	7448	28	169	0.80	-0.78	1.98	14.8	0.5
10	2500	520	8.62	7198	7620	27	161	0.75	-0.74	1.91	14.6	0.5
10	2500	540	8.51	7374	7787	27	153	0.71	-0.70	1.85	14.4	0.5
10	2500	560	8.40	7545	7948	26	146	0.67	-0.66	1.79	14.2	0.5
10	2500	580	8.30	7710	8106	25	140	0.64	-0.63	1.73	14.0	0.5
10	2500	600	8.20	7868	8255	25	134	0.61	-0.60	1.68	13.9	0.5

Figure 6-67 (Sheet 4 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	3000	400	10.50	6750	7387	35	245	1.17	-1.14	2.40	17.7	0.6
10	3000	420	10.37	6996	7612	34	232	1.09	-1.06	2.30	17.5	0.6
10	3000	440	10.25	7235	7833	33	220	1.02	-0.99	2.21	17.3	0.6
10	3000	460	10.13	7468	8048	32	208	0.95	-0.93	2.13	17.1	0.6
10	3000	480	10.01	7693	8257	31	199	0.89	-0.87	2.05	16.9	0.6
10	3000	500	9.89	7912	8462	30	189	0.84	-0.82	1.97	16.7	0.6
10	3000	520	9.77	8125	8662	29	180	0.79	-0.77	1.91	16.5	0.6
10	3000	540	9.66	8332	8856	29	172	0.75	-0.73	1.84	16.3	0.7
10	3000	560	9.55	8534	9045	28	164	0.71	-0.69	1.78	16.1	0.7
10	3000	580	9.44	8729	9230	27	157	0.67	-0.66	1.73	15.9	0.7
10	3000	600	9.33	8915	9406	26	151	0.64	-0.63	1.68	15.8	0.7
10	3500	400	11.59	7427	8210	38	267	1.22	-1.19	2.38	19.6	0.7
10	3500	420	11.46	7704	8462	36	253	1.14	-1.11	2.29	19.4	0.7
10	3500	440	11.33	7974	8708	35	240	1.06	-1.03	2.20	19.2	0.7
10	3500	460	11.21	8236	8949	34	228	0.99	-0.97	2.12	18.9	0.7
10	3500	480	11.08	8492	9185	33	217	0.93	-0.91	2.04	18.7	0.8
10	3500	500	10.96	8740	9415	32	207	0.88	-0.86	1.97	18.5	0.8
10	3500	520	10.85	8983	9641	31	198	0.83	-0.81	1.90	18.3	0.8
10	3500	540	10.73	9219	9861	30	189	0.78	-0.77	1.84	18.1	0.8
10	3500	560	10.61	9448	10076	30	181	0.74	-0.73	1.78	17.9	0.8
10	3500	580	10.50	9672	10286	29	173	0.70	-0.69	1.72	17.7	0.8
10	3500	600	10.39	9885	10486	28	166	0.67	-0.66	1.68	17.6	0.8
10	4000	400	12.61	8057	8996	39	287	1.27	-1.23	2.37	21.3	0.8
10	4000	420	12.48	8364	9271	38	273	1.18	-1.15	2.27	21.1	0.8
10	4000	440	12.35	8662	9541	37	259	1.10	-1.07	2.19	20.9	0.8
10	4000	460	12.22	8953	9806	36	247	1.03	-1.01	2.11	20.7	0.9
10	4000	480	12.10	9237	10066	35	235	0.97	-0.94	2.03	20.4	0.9
10	4000	500	11.97	9513	10320	34	224	0.91	-0.89	1.96	20.2	0.9
10	4000	520	11.85	9783	10570	33	214	0.86	-0.84	1.90	20.0	0.9
10	4000	540	11.73	10047	10814	32	205	0.81	-0.80	1.83	19.8	0.9
10	4000	560	11.61	10303	11053	31	196	0.77	-0.75	1.78	19.6	0.9
10	4000	580	11.50	10554	11286	30	188	0.73	-0.72	1.72	19.4	1.0
10	4000	600	11.39	10791	11508	30	181	0.70	-0.68	1.67	19.3	1.0
10	4500	400	13.57	8650	9751	41	306	1.30	-1.27	2.35	22.9	1.0
10	4500	420	13.44	8984	10048	40	291	1.22	-1.18	2.26	22.7	1.0
10	4500	440	13.31	9309	10340	39	277	1.14	-1.11	2.17	22.5	1.0
10	4500	460	13.18	9627	10627	37	264	1.07	-1.04	2.10	22.3	1.0
10	4500	480	13.05	9938	10909	36	251	1.00	-0.98	2.02	22.1	1.0
10	4500	500	12.93	10241	11186	35	240	0.94	-0.92	1.95	21.8	1.1
10	4500	520	12.81	10537	11458	34	230	0.89	-0.87	1.89	21.6	1.1
10	4500	540	12.68	10826	11724	34	220	0.84	-0.82	1.83	21.4	1.1
10	4500	560	12.56	11109	11985	33	211	0.80	-0.78	1.77	21.2	1.1
10	4500	580	12.45	11384	12242	32	203	0.76	-0.74	1.72	21.0	1.1
10	4500	600	12.34	11644	12484	31	195	0.72	-0.71	1.67	20.9	1.2
10	5000	400	14.46	9211	10480	43	324	1.34	-1.30	2.34	24.5	1.1
10	5000	420	14.35	9570	10798	41	308	1.25	-1.21	2.25	24.3	1.1
10	5000	440	14.22	9922	11111	40	293	1.17	-1.14	2.16	24.0	1.1
10	5000	460	14.09	10265	11418	39	280	1.10	-1.07	2.09	23.8	1.2
10	5000	480	13.96	10601	11721	38	267	1.03	-1.00	2.01	23.6	1.2
10	5000	500	13.84	10930	12019	37	255	0.97	-0.95	1.95	23.4	1.2
10	5000	520	13.71	11251	12312	36	244	0.92	-0.89	1.88	23.2	1.2
10	5000	540	13.59	11565	12599	35	234	0.87	-0.85	1.82	23.0	1.2
10	5000	560	13.47	11872	12882	34	225	0.82	-0.80	1.77	22.8	1.2
10	5000	580	13.35	12172	13159	33	216	0.78	-0.76	1.71	22.6	1.3
10	5000	600	13.25	12453	13419	33	208	0.74	-0.73	1.67	22.4	1.3
10	5500	400	15.36	9744	11189	44	340	1.37	-1.33	2.32	26.0	1.2
10	5500	420	15.22	10129	11526	43	324	1.28	-1.24	2.23	25.7	1.2
10	5500	440	15.09	10505	11857	41	309	1.20	-1.16	2.15	25.5	1.3
10	5500	460	14.96	10873	12185	40	295	1.12	-1.09	2.08	25.3	1.3
10	5500	480	14.83	11233	12507	39	282	1.06	-1.03	2.00	25.1	1.3
10	5500	500	14.71	11585	12825	38	269	1.00	-0.97	1.94	24.9	1.3
10	5500	520	14.58	11930	13137	37	258	0.94	-0.92	1.88	24.6	1.3
10	5500	540	14.46	12268	13444	36	248	0.89	-0.87	1.82	24.4	1.4
10	5500	560	14.33	12598	13746	35	238	0.84	-0.83	1.76	24.2	1.4
10	5500	580	14.22	12921	14043	35	228	0.80	-0.78	1.71	24.0	1.4
10	5500	600	14.11	13222	14321	34	220	0.76	-0.75	1.67	23.9	1.5

Figure 6-67 (Sheet 5 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	3000	400	9.28	5668	6591	37	212	1.33	-1.30	2.38	15.7	0.5
15	3000	420	9.12	6051	6754	36	200	1.24	-1.21	2.28	15.4	0.5
15	3000	440	8.96	6225	6910	35	188	1.16	-1.13	2.19	15.1	0.5
15	3000	460	8.81	6353	7062	34	178	1.09	-1.07	2.11	14.9	0.5
15	3000	480	8.66	6553	7207	33	169	1.02	-1.00	2.03	14.6	0.5
15	3000	500	8.51	6707	7347	32	160	0.97	-0.95	1.96	14.4	0.5
15	3000	520	8.37	6854	7482	31	152	0.91	-0.90	1.89	14.1	0.5
15	3000	540	8.23	6996	7612	30	144	0.87	-0.85	1.83	13.9	0.5
15	3000	560	8.09	7131	7737	30	137	0.82	-0.81	1.77	13.7	0.5
15	3000	580	7.96	7262	7857	29	131	0.78	-0.77	1.71	13.5	0.5
15	3000	600	7.84	7384	7970	29	125	0.75	-0.73	1.66	13.2	0.5
15	3500	400	10.33	6511	7392	35	233	1.38	-1.34	2.36	17.5	0.6
15	3500	420	10.16	6721	7578	34	219	1.28	-1.25	2.27	17.2	0.6
15	3500	440	10.00	6922	7757	33	207	1.20	-1.18	2.19	16.9	0.6
15	3500	460	9.84	7116	7930	32	196	1.13	-1.11	2.10	16.6	0.6
15	3500	480	9.68	7303	8098	31	186	1.06	-1.04	2.02	16.4	0.6
15	3500	500	9.53	7482	8260	30	177	1.00	-0.98	1.95	16.1	0.6
15	3500	520	9.38	7654	8416	29	168	0.95	-0.93	1.88	15.9	0.6
15	3500	540	9.23	7820	8567	28	160	0.90	-0.88	1.82	15.6	0.6
15	3500	560	9.09	7979	8713	27	152	0.85	-0.84	1.76	15.4	0.6
15	3500	580	8.95	8133	8854	26	145	0.81	-0.80	1.71	15.1	0.6
15	3500	600	8.82	8276	8986	25	139	0.77	-0.76	1.66	14.9	0.6
15	4000	400	11.32	7113	8160	41	252	1.42	-1.38	2.34	19.1	0.7
15	4000	420	11.14	7349	8367	39	238	1.32	-1.29	2.25	18.8	0.7
15	4000	440	10.98	7576	8567	38	225	1.24	-1.21	2.17	18.5	0.7
15	4000	460	10.81	7795	8762	37	213	1.17	-1.14	2.09	18.3	0.7
15	4000	480	10.65	8007	8950	36	202	1.10	-1.07	2.01	18.0	0.7
15	4000	500	10.49	8210	9133	35	192	1.04	-1.02	1.94	17.7	0.7
15	4000	520	10.34	8406	9309	34	183	0.98	-0.96	1.88	17.5	0.7
15	4000	540	10.18	8596	9481	33	175	0.93	-0.91	1.82	17.2	0.7
15	4000	560	10.04	8778	9646	32	167	0.88	-0.87	1.76	17.0	0.7
15	4000	580	9.89	8954	9807	31	159	0.84	-0.82	1.70	16.7	0.7
15	4000	600	9.76	9118	9957	30	152	0.80	-0.79	1.66	16.5	0.7
15	4500	400	12.25	7680	8901	42	269	1.45	-1.42	2.33	20.7	0.8
15	4500	420	12.08	7941	9128	41	255	1.36	-1.33	2.24	20.4	0.8
15	4500	440	11.90	8193	9348	40	241	1.27	-1.25	2.15	20.1	0.8
15	4500	460	11.73	8437	9562	39	229	1.20	-1.17	2.07	19.8	0.8
15	4500	480	11.57	8672	9770	38	218	1.13	-1.11	2.00	19.6	0.8
15	4500	500	11.41	8899	9972	37	207	1.07	-1.04	1.93	19.3	0.8
15	4500	520	11.25	9118	10166	36	197	1.01	-0.99	1.87	19.0	0.8
15	4500	540	11.09	9330	10358	35	188	0.96	-0.94	1.81	18.7	0.8
15	4500	560	10.94	9535	10543	34	180	0.91	-0.89	1.75	18.5	0.8
15	4500	580	10.79	9732	10722	33	172	0.86	-0.85	1.70	18.2	0.8
15	4500	600	10.65	9916	10899	33	165	0.83	-0.81	1.65	18.0	0.8
15	5000	400	13.14	8219	9620	44	286	1.49	-1.45	2.31	22.2	0.9
15	5000	420	12.96	8504	9865	42	271	1.39	-1.36	2.22	21.9	0.9
15	5000	440	12.79	8779	10103	41	257	1.31	-1.28	2.14	21.6	1.0
15	5000	460	12.62	9046	10336	40	244	1.23	-1.20	2.06	21.3	1.0
15	5000	480	12.45	9304	10562	39	232	1.16	-1.13	1.99	21.0	1.0
15	5000	500	12.28	9554	10783	38	221	1.09	-1.07	1.92	20.8	1.0
15	5000	520	12.12	9795	10998	37	211	1.03	-1.01	1.86	20.5	1.0
15	5000	540	11.96	10029	11206	36	201	0.98	-0.96	1.80	20.2	1.0
15	5000	560	11.80	10255	11409	36	193	0.93	-0.92	1.75	19.9	1.0
15	5000	580	11.65	10473	11606	35	184	0.89	-0.87	1.70	19.7	1.0
15	5000	600	11.51	10676	11789	34	177	0.85	-0.83	1.65	19.5	1.0
15	5500	400	14.00	8732	10320	45	301	1.52	-1.48	2.29	23.7	1.1
15	5500	420	13.81	9040	10582	44	286	1.42	-1.39	2.21	23.3	1.1
15	5500	440	13.64	9338	10838	43	271	1.33	-1.30	2.13	23.0	1.1
15	5500	460	13.46	9628	11088	41	258	1.25	-1.23	2.05	22.7	1.1
15	5500	480	13.29	9908	11332	40	246	1.18	-1.16	1.98	22.5	1.1
15	5500	500	13.12	10179	11570	39	234	1.12	-1.10	1.92	22.2	1.1
15	5500	520	12.95	10442	11802	38	224	1.06	-1.04	1.85	21.9	1.1
15	5500	540	12.79	10697	12028	37	214	1.00	-0.99	1.80	21.6	1.1
15	5500	560	12.63	10944	12248	37	205	0.95	-0.94	1.74	21.3	1.1
15	5500	580	12.48	11182	12461	36	196	0.91	-0.89	1.69	21.1	1.1
15	5500	600	12.34	11402	12660	35	188	0.87	-0.85	1.65	20.9	1.2

Figure 6-67 (Sheet 8 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	1500	400	4.82	3002	3356	32	116	1.28	-1.26	2.43	8.1	0.2
20	1500	420	4.68	3062	3410	31	108	1.20	-1.18	2.32	7.9	0.2
20	1500	440	4.55	3118	3460	31	101	1.12	-1.11	2.22	7.7	0.2
20	1500	460	4.43	3170	3507	30	95	1.06	-1.04	2.13	7.5	0.1
20	1500	480	4.31	3218	3551	29	89	1.00	-0.99	2.05	7.3	0.1
20	1500	500	4.19	3263	3592	29	83	0.95	-0.93	1.97	7.1	0.1
20	1500	520	4.09	3305	3630	28	79	0.90	-0.89	1.90	6.9	0.1
20	1500	540	3.98	3345	3666	28	74	0.85	-0.84	1.83	6.7	0.1
20	1500	560	3.88	3381	3699	27	70	0.81	-0.80	1.77	6.6	0.1
20	1500	580	3.78	3415	3730	27	66	0.78	-0.77	1.71	6.4	0.1
20	1500	600	3.69	3447	3759	27	63	0.74	-0.74	1.66	6.2	0.1
20	2000	400	6.07	3762	4261	35	141	1.36	-1.33	2.41	10.3	0.2
20	2000	420	5.91	3847	4336	34	132	1.27	-1.24	2.30	10.0	0.2
20	2000	440	5.76	3928	4407	33	123	1.19	-1.17	2.21	9.7	0.2
20	2000	460	5.61	4002	4474	32	116	1.12	-1.10	2.12	9.5	0.2
20	2000	480	5.46	4073	4537	31	109	1.06	-1.04	2.04	9.3	0.2
20	2000	500	5.34	4139	4597	31	102	1.00	-0.98	1.96	9.0	0.2
20	2000	520	5.21	4200	4652	30	97	0.95	-0.93	1.89	8.8	0.2
20	2000	540	5.09	4259	4705	30	91	0.90	-0.89	1.83	8.6	0.2
20	2000	560	4.97	4313	4754	29	86	0.86	-0.85	1.77	8.4	0.2
20	2000	580	4.86	4364	4801	29	82	0.82	-0.81	1.71	8.2	0.2
20	2000	600	4.75	4412	4844	28	78	0.78	-0.77	1.66	8.0	0.2
20	2500	400	7.21	4456	5109	37	164	1.42	-1.39	2.38	12.2	0.3
20	2500	420	7.04	4566	5206	36	153	1.33	-1.30	2.28	11.9	0.3
20	2500	440	6.87	4670	5297	35	144	1.24	-1.22	2.19	11.6	0.3
20	2500	460	6.71	4768	5384	34	135	1.17	-1.15	2.11	11.3	0.3
20	2500	480	6.56	4860	5466	33	127	1.10	-1.09	2.03	11.1	0.3
20	2500	500	6.41	4948	5543	33	120	1.04	-1.03	1.95	10.8	0.3
20	2500	520	6.27	5030	5617	32	113	0.99	-0.97	1.89	10.6	0.3
20	2500	540	6.13	5107	5686	31	107	0.94	-0.93	1.82	10.4	0.3
20	2500	560	6.00	5180	5752	31	102	0.89	-0.88	1.76	10.1	0.3
20	2500	580	5.87	5250	5815	30	96	0.85	-0.84	1.71	9.9	0.3
20	2500	600	5.75	5314	5873	30	92	0.81	-0.81	1.65	9.7	0.3
20	3000	400	8.27	5097	5915	39	194	1.47	-1.44	2.36	14.0	0.4
20	3000	420	8.09	5232	6031	38	173	1.38	-1.35	2.27	13.7	0.4
20	3000	440	7.91	5359	6142	37	162	1.29	-1.27	2.19	13.4	0.4
20	3000	460	7.74	5480	6248	36	153	1.21	-1.19	2.09	13.1	0.4
20	3000	480	7.58	5594	6348	35	144	1.15	-1.13	2.02	12.8	0.4
20	3000	500	7.42	5703	6444	34	136	1.08	-1.07	1.95	12.5	0.4
20	3000	520	7.26	5805	6534	34	129	1.03	-1.01	1.88	12.3	0.4
20	3000	540	7.11	5902	6621	33	122	0.97	-0.96	1.82	12.0	0.4
20	3000	560	6.97	5994	6703	32	116	0.93	-0.91	1.76	11.8	0.4
20	3000	580	6.83	6082	6781	32	110	0.88	-0.87	1.70	11.5	0.4
20	3000	600	6.70	6163	6854	31	105	0.85	-0.84	1.65	11.3	0.4
20	3500	400	9.27	5697	6686	41	203	1.52	-1.48	2.34	15.7	0.5
20	3500	420	9.08	5855	6821	40	191	1.42	-1.39	2.25	15.3	0.5
20	3500	440	8.89	6005	6951	39	180	1.33	-1.31	2.16	15.0	0.5
20	3500	460	8.71	6148	7075	38	169	1.25	-1.23	2.08	14.7	0.5
20	3500	480	8.54	6284	7193	37	160	1.18	-1.16	2.01	14.4	0.5
20	3500	500	8.37	6413	7306	36	151	1.12	-1.10	1.94	14.1	0.5
20	3500	520	8.20	6536	7414	35	144	1.06	-1.04	1.87	13.9	0.5
20	3500	540	8.04	6652	7517	34	136	1.01	-0.99	1.81	13.6	0.5
20	3500	560	7.89	6763	7615	34	129	0.96	-0.94	1.75	13.3	0.5
20	3500	580	7.74	6869	7709	33	123	0.91	-0.90	1.70	13.1	0.5
20	3500	600	7.60	6966	7796	33	117	0.87	-0.86	1.65	12.8	0.5
20	4000	400	10.22	6261	7430	42	221	1.56	-1.52	2.32	17.3	0.6
20	4000	420	10.02	6442	7583	41	208	1.46	-1.43	2.23	16.9	0.6
20	4000	440	9.83	6615	7730	40	196	1.37	-1.34	2.15	16.6	0.6
20	4000	460	9.64	6779	7871	39	185	1.29	-1.26	2.07	16.3	0.6
20	4000	480	9.45	6936	8007	38	175	1.22	-1.19	2.00	16.0	0.6
20	4000	500	9.28	7085	8136	37	166	1.15	-1.13	1.93	15.7	0.6
20	4000	520	9.10	7228	8261	37	157	1.09	-1.07	1.86	15.4	0.6
20	4000	540	8.93	7363	8380	36	149	1.04	-1.02	1.80	15.1	0.6
20	4000	560	8.77	7493	8494	35	142	0.99	-0.97	1.74	14.8	0.6
20	4000	580	8.61	7617	8603	34	135	0.94	-0.93	1.69	14.6	0.6
20	4000	600	8.47	7731	8704	34	129	0.90	-0.89	1.64	14.3	0.6

Figure 6-67 (Sheet 9 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	4500	400	11.12	6796	8150	44	237	1.59	-1.56	2.31	18.8	0.7
20	4500	420	10.91	6959	8321	43	223	1.49	-1.46	2.22	18.4	0.7
20	4500	440	10.71	7193	8485	42	211	1.40	-1.37	2.13	18.1	0.7
20	4500	460	10.52	7378	8642	41	200	1.32	-1.30	2.06	17.8	0.7
20	4500	480	10.33	7555	8794	40	189	1.25	-1.22	1.98	17.5	0.7
20	4500	500	10.14	7725	8940	39	179	1.18	-1.16	1.92	17.1	0.7
20	4500	520	9.96	7887	9080	38	170	1.12	-1.10	1.85	16.8	0.7
20	4500	540	9.79	8041	9215	37	162	1.06	-1.05	1.79	16.5	0.7
20	4500	560	9.62	8189	9344	36	154	1.01	-1.00	1.74	16.2	0.7
20	4500	580	9.45	8330	9468	36	147	0.96	-0.95	1.69	16.0	0.7
20	4500	600	9.30	8461	9583	35	140	0.92	-0.91	1.64	15.7	0.7
20	5000	400	11.98	7305	8652	45	252	1.62	-1.59	2.29	20.3	0.8
20	5000	420	11.77	7529	8838	44	238	1.52	-1.49	2.20	19.9	0.8
20	5000	440	11.56	7744	9018	43	225	1.43	-1.40	2.12	19.5	0.8
20	5000	460	11.36	7950	9191	42	213	1.35	-1.32	2.04	19.2	0.8
20	5000	480	11.17	8147	9359	41	202	1.27	-1.25	1.97	18.9	0.8
20	5000	500	10.97	8336	9520	40	192	1.21	-1.18	1.91	18.5	0.8
20	5000	520	10.79	8517	9676	39	183	1.14	-1.12	1.85	18.2	0.8
20	5000	540	10.61	8690	9826	38	174	1.09	-1.07	1.79	17.9	0.8
20	5000	560	10.43	8856	9970	38	166	1.03	-1.02	1.73	17.6	0.8
20	5000	580	10.26	9014	10108	37	158	0.99	-0.97	1.68	17.3	0.8
20	5000	600	10.11	9160	10236	36	151	0.94	-0.93	1.64	17.1	0.8
20	5500	400	12.81	7791	9537	47	267	1.65	-1.62	2.27	21.6	0.9
20	5500	420	12.59	8036	9738	45	252	1.55	-1.52	2.19	21.3	0.9
20	5500	440	12.38	8272	9933	44	239	1.46	-1.43	2.11	20.9	0.9
20	5500	460	12.18	8497	10122	43	226	1.37	-1.35	2.03	20.6	0.9
20	5500	480	11.97	8714	10304	42	215	1.30	-1.27	1.96	20.2	0.9
20	5500	500	11.78	8922	10481	41	204	1.23	-1.21	1.90	19.9	0.9
20	5500	520	11.58	9121	10651	40	194	1.17	-1.15	1.84	19.6	0.9
20	5500	540	11.40	9312	10815	39	185	1.11	-1.09	1.78	19.3	0.9
20	5500	560	11.21	9496	10974	39	177	1.06	-1.04	1.73	19.0	0.9
20	5500	580	11.04	9671	11126	38	169	1.01	-0.99	1.68	18.7	0.9
20	5500	600	10.89	9833	11266	37	162	0.96	-0.95	1.63	18.4	1.0
20	6000	400	13.61	8258	10207	48	280	1.68	-1.64	2.25	23.0	1.0
20	6000	420	13.39	8523	10423	46	265	1.57	-1.54	2.17	22.6	1.0
20	6000	440	13.17	8778	10633	45	251	1.48	-1.45	2.09	22.3	1.0
20	6000	460	12.96	9023	10836	44	239	1.40	-1.37	2.02	21.9	1.0
20	6000	480	12.75	9258	11033	43	227	1.32	-1.30	1.95	21.6	1.0
20	6000	500	12.55	9485	11223	42	216	1.25	-1.23	1.89	21.2	1.0
20	6000	520	12.35	9702	11408	41	205	1.19	-1.17	1.83	20.9	1.0
20	6000	540	12.16	9912	11586	40	195	1.13	-1.11	1.77	20.6	1.0
20	6000	560	11.98	10113	11759	40	187	1.08	-1.06	1.72	20.2	1.0
20	6000	580	11.80	10304	11923	39	179	1.03	-1.01	1.67	19.9	1.0
20	6000	600	11.64	10480	12076	38	171	0.98	-0.97	1.63	19.7	1.1
20	6500	400	14.38	8707	10866	49	293	1.70	-1.66	2.24	24.3	1.1
20	6500	420	14.15	8992	11095	48	278	1.60	-1.56	2.16	23.9	1.1
20	6500	440	13.93	9266	11318	46	263	1.50	-1.47	2.08	23.5	1.1
20	6500	460	13.72	9530	11535	45	250	1.42	-1.39	2.01	23.2	1.1
20	6500	480	13.51	9784	11746	44	238	1.34	-1.32	1.94	22.8	1.1
20	6500	500	13.30	10028	11950	43	227	1.27	-1.25	1.88	22.5	1.1
20	6500	520	13.10	10263	12149	42	216	1.21	-1.19	1.82	22.1	1.1
20	6500	540	12.90	10490	12341	41	206	1.15	-1.13	1.77	21.8	1.1
20	6500	560	12.71	10708	12526	41	197	1.09	-1.08	1.72	21.5	1.1
20	6500	580	12.54	10915	12703	40	189	1.04	-1.03	1.67	21.2	1.2
20	6500	600	12.38	11105	12868	39	181	1.00	-0.99	1.63	20.9	1.2
20	7000	400	15.12	9140	11513	50	305	1.72	-1.68	2.22	25.6	1.2
20	7000	420	14.89	9444	11755	49	290	1.62	-1.58	2.14	25.2	1.2
20	7000	440	14.67	9737	11992	47	275	1.52	-1.49	2.07	24.8	1.2
20	7000	460	14.45	10019	12222	46	261	1.44	-1.41	2.00	24.4	1.2
20	7000	480	14.24	10291	12446	45	249	1.36	-1.34	1.93	24.1	1.2
20	7000	500	14.03	10553	12664	44	237	1.29	-1.27	1.87	23.7	1.2
20	7000	520	13.82	10806	12875	43	226	1.23	-1.20	1.81	23.4	1.2
20	7000	540	13.62	11049	13080	42	216	1.17	-1.15	1.76	23.0	1.2
20	7000	560	13.43	11284	13279	42	207	1.11	-1.09	1.71	22.7	1.3
20	7000	580	13.25	11505	13468	41	198	1.06	-1.05	1.66	22.4	1.3
20	7000	600	13.10	11710	13643	40	190	1.02	-1.00	1.62	22.1	1.4

**Figure 6-67 (Sheet 10 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	7500	400	15.84	9559	12150	51	317	1.74	-1.70	2.20	26.8	1.3
20	7500	420	15.61	9882	12406	49	301	1.64	-1.60	2.13	26.4	1.3
20	7500	440	15.39	10193	12655	48	286	1.54	-1.51	2.05	26.0	1.3
20	7500	460	15.16	10493	12897	47	272	1.46	-1.43	1.99	25.6	1.4
20	7500	480	14.95	10782	13134	46	259	1.39	-1.35	1.92	25.3	1.4
20	7500	500	14.73	11062	13364	45	247	1.31	-1.28	1.86	24.9	1.4
20	7500	520	14.53	11331	13589	44	236	1.24	-1.22	1.81	24.5	1.4
20	7500	540	14.32	11591	13806	43	226	1.18	-1.16	1.75	24.2	1.4
20	7500	560	14.13	11842	14017	42	216	1.13	-1.11	1.70	23.9	1.4
20	7500	580	13.95	12078	14217	42	207	1.08	-1.06	1.66	23.6	1.4
20	7500	600	13.80	12296	14403	41	199	1.03	-1.02	1.62	23.3	1.5
20	8000	400	16.54	9966	12779	52	328	1.76	-1.72	2.19	28.0	1.4
20	8000	420	16.31	10306	13046	50	312	1.65	-1.62	2.11	27.6	1.5
20	8000	440	16.08	10634	13308	49	297	1.56	-1.53	2.04	27.2	1.5
20	8000	460	15.86	10952	13563	48	282	1.47	-1.45	1.98	26.8	1.5
20	8000	480	15.64	11259	13812	47	269	1.40	-1.37	1.91	26.4	1.5
20	8000	500	15.42	11555	14054	46	257	1.32	-1.30	1.85	26.1	1.5
20	8000	520	15.21	11841	14290	45	246	1.26	-1.24	1.80	25.7	1.5
20	8000	540	15.01	12118	14520	44	235	1.20	-1.18	1.75	25.4	1.5
20	8000	560	14.81	12383	14743	43	225	1.14	-1.12	1.70	25.0	1.5
20	8000	580	14.64	12634	14953	43	216	1.09	-1.08	1.65	24.7	1.6
20	8000	600	14.48	12864	15149	42	208	1.05	-1.03	1.62	24.5	1.7
20	8500	400	17.23	10360	13401	52	339	1.77	-1.74	2.17	29.1	1.6
20	8500	420	16.99	10719	13679	51	322	1.67	-1.64	2.10	28.7	1.6
20	8500	440	16.76	11064	13952	50	307	1.58	-1.54	2.03	28.3	1.6
20	8500	460	16.53	11398	14219	49	292	1.49	-1.46	1.97	27.9	1.6
20	8500	480	16.31	11722	14479	48	279	1.41	-1.39	1.90	27.6	1.6
20	8500	500	16.09	12035	14734	47	266	1.34	-1.32	1.85	27.2	1.6
20	8500	520	15.88	12337	14982	46	255	1.27	-1.25	1.79	26.8	1.6
20	8500	540	15.67	12629	15223	45	244	1.21	-1.19	1.74	26.5	1.6
20	8500	560	15.48	12910	15457	44	234	1.16	-1.14	1.69	26.2	1.6
20	8500	580	15.30	13174	15678	43	224	1.11	-1.09	1.65	25.9	1.7
20	8500	600	15.16	13416	15882	43	216	1.06	-1.05	1.61	25.6	1.8
20	9000	400	17.89	10743	14015	53	349	1.79	-1.75	2.16	30.2	1.7
20	9000	420	17.66	11119	14304	52	332	1.68	-1.65	2.09	29.8	1.7
20	9000	440	17.42	11481	14588	51	316	1.59	-1.56	2.02	29.4	1.7
20	9000	460	17.19	11832	14866	50	302	1.50	-1.48	1.95	29.1	1.7
20	9000	480	16.97	12172	15138	49	288	1.43	-1.40	1.89	28.7	1.7
20	9000	500	16.75	12501	15404	48	275	1.35	-1.33	1.84	28.3	1.7
20	9000	520	16.53	12820	15664	47	264	1.29	-1.26	1.78	27.9	1.7
20	9000	540	16.33	13127	15916	46	252	1.23	-1.21	1.73	27.6	1.7
20	9000	560	16.13	13423	16161	45	242	1.17	-1.15	1.69	27.3	1.8
20	9000	580	15.96	13699	16391	44	233	1.12	-1.10	1.65	27.0	1.8
20	9000	600	15.82	13952	16603	44	224	1.08	-1.06	1.61	26.7	2.0
20	9500	400	18.54	11117	14623	54	359	1.80	-1.76	2.14	31.3	1.8
20	9500	420	18.30	11506	14923	53	342	1.70	-1.66	2.07	30.9	1.8
20	9500	440	18.07	11888	15217	52	326	1.60	-1.57	2.01	30.5	1.8
20	9500	460	17.84	12256	15506	50	311	1.52	-1.49	1.94	30.1	1.8
20	9500	480	17.61	12612	15789	49	297	1.44	-1.41	1.88	29.8	1.8
20	9500	500	17.39	12957	16066	48	284	1.37	-1.34	1.83	29.4	1.8
20	9500	520	17.17	13290	16337	47	272	1.30	-1.28	1.78	29.0	1.8
20	9500	540	16.96	13613	16600	47	261	1.24	-1.22	1.73	28.7	1.8
20	9500	560	16.77	13922	16855	46	250	1.18	-1.16	1.68	28.3	1.9
20	9500	580	16.61	14210	17093	45	241	1.13	-1.12	1.64	28.1	2.0
20	9500	600	16.47	14474	17313	44	232	1.09	-1.07	1.61	27.8	2.2
20	10000	400	19.18	11481	15225	55	368	1.81	-1.78	2.13	32.4	1.9
20	10000	420	18.94	11889	15535	53	351	1.71	-1.68	2.06	32.0	1.9
20	10000	440	18.70	12285	15840	52	335	1.62	-1.58	1.99	31.6	1.9
20	10000	460	18.47	12668	16140	51	320	1.53	-1.50	1.93	31.2	1.9
20	10000	480	18.24	13040	16433	50	306	1.45	-1.42	1.88	30.8	1.9
20	10000	500	18.01	13401	16721	49	293	1.38	-1.35	1.82	30.4	1.9
20	10000	520	17.80	13750	17002	48	280	1.31	-1.29	1.77	30.1	1.9
20	10000	540	17.59	14087	17275	47	269	1.25	-1.23	1.72	29.7	2.0
20	10000	560	17.40	14410	17540	46	258	1.20	-1.18	1.68	29.4	2.0
20	10000	580	17.24	14709	17787	46	248	1.15	-1.13	1.64	29.1	2.1
20	10000	600	17.10	14982	18013	45	240	1.10	-1.09	1.60	28.9	2.3

Figure 6-67 (Sheet 11 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	1500	400	3.75	2154	2625	39	87	1.56	-1.55	2.41	6.3	0.1
30	1500	420	3.62	2183	2649	38	91	1.47	-1.46	2.31	6.1	0.1
30	1500	440	3.50	2209	2670	38	75	1.39	-1.38	2.21	5.9	0.1
30	1500	460	3.38	2233	2690	37	70	1.32	-1.30	2.12	5.7	0.1
30	1500	480	3.27	2255	2708	37	65	1.25	-1.24	2.04	5.5	0.1
30	1500	500	3.17	2275	2725	36	61	1.19	-1.18	1.96	5.4	0.1
30	1500	520	3.07	2293	2740	36	58	1.13	-1.12	1.89	5.2	0.1
30	1500	540	2.98	2310	2754	35	54	1.08	-1.07	1.83	5.0	0.1
30	1500	560	2.89	2325	2767	35	51	1.04	-1.03	1.76	4.9	0.1
30	1500	580	2.81	2340	2779	35	48	0.99	-0.99	1.71	4.7	0.1
30	1500	600	2.73	2353	2790	35	46	0.95	-0.95	1.65	4.6	0.1
30	2000	400	4.81	2755	3404	41	106	1.63	-1.61	2.39	8.1	0.2
30	2000	420	4.66	2799	3440	40	99	1.53	-1.51	2.29	7.9	0.2
30	2000	440	4.51	2838	3472	39	92	1.44	-1.43	2.19	7.6	0.2
30	2000	460	4.37	2875	3502	39	86	1.36	-1.35	2.11	7.4	0.2
30	2000	480	4.23	2909	3530	38	80	1.29	-1.28	2.03	7.2	0.2
30	2000	500	4.11	2940	3555	38	75	1.23	-1.22	1.95	6.9	0.1
30	2000	520	3.99	2968	3579	37	71	1.17	-1.16	1.88	6.7	0.1
30	2000	540	3.87	2995	3601	37	67	1.12	-1.11	1.82	6.5	0.1
30	2000	560	3.76	3019	3621	36	63	1.07	-1.06	1.76	6.4	0.1
30	2000	580	3.66	3041	3640	36	60	1.03	-1.02	1.70	6.2	0.1
30	2000	600	3.57	3062	3657	36	56	0.98	-0.98	1.65	6.0	0.1
30	2500	400	5.81	3316	4153	43	124	1.68	-1.66	2.36	9.8	0.2
30	2500	420	5.63	3375	4200	42	115	1.58	-1.56	2.27	9.5	0.2
30	2500	440	5.46	3430	4244	41	108	1.49	-1.47	2.18	9.2	0.2
30	2500	460	5.30	3480	4285	40	101	1.41	-1.39	2.09	9.0	0.2
30	2500	480	5.15	3526	4323	40	95	1.33	-1.32	2.01	8.7	0.2
30	2500	500	5.00	3569	4358	39	99	1.27	-1.25	1.94	8.5	0.2
30	2500	520	4.86	3609	4390	39	84	1.21	-1.20	1.87	8.2	0.2
30	2500	540	4.73	3646	4421	38	79	1.15	-1.14	1.81	8.0	0.2
30	2500	560	4.60	3680	4449	38	74	1.10	-1.09	1.75	7.8	0.2
30	2500	580	4.48	3712	4476	37	70	1.05	-1.05	1.69	7.6	0.2
30	2500	600	4.37	3742	4500	37	67	1.01	-1.00	1.64	7.4	0.2
30	3000	400	6.76	3845	4877	44	140	1.73	-1.70	2.34	11.4	0.3
30	3000	420	6.56	3919	4936	43	131	1.62	-1.60	2.25	11.1	0.3
30	3000	440	6.37	3989	4991	43	123	1.53	-1.51	2.16	10.8	0.3
30	3000	460	6.19	4053	5043	42	115	1.45	-1.43	2.08	10.5	0.3
30	3000	480	6.02	4113	5091	41	108	1.37	-1.35	2.00	10.2	0.3
30	3000	500	5.86	4169	5136	41	101	1.30	-1.29	1.93	9.9	0.3
30	3000	520	5.71	4220	5178	40	96	1.24	-1.23	1.86	9.6	0.3
30	3000	540	5.56	4269	5217	39	90	1.18	-1.17	1.80	9.4	0.3
30	3000	560	5.42	4314	5254	39	85	1.13	-1.12	1.74	9.2	0.3
30	3000	580	5.28	4355	5289	38	81	1.08	-1.07	1.69	8.9	0.3
30	3000	600	5.15	4394	5320	38	77	1.04	-1.03	1.64	8.7	0.3
30	3500	400	7.66	4345	5579	46	156	1.77	-1.74	2.32	12.9	0.4
30	3500	420	7.45	4436	5650	45	146	1.66	-1.64	2.23	12.6	0.4
30	3500	440	7.24	4520	5717	44	136	1.56	-1.54	2.14	12.2	0.4
30	3500	460	7.05	4599	5780	43	128	1.48	-1.46	2.06	11.9	0.4
30	3500	480	6.86	4673	5838	42	120	1.40	-1.39	1.99	11.6	0.4
30	3500	500	6.69	4742	5893	42	113	1.33	-1.32	1.92	11.3	0.3
30	3500	520	6.52	4806	5945	41	107	1.27	-1.25	1.85	11.0	0.3
30	3500	540	6.35	4866	5994	41	101	1.21	-1.20	1.79	10.7	0.3
30	3500	560	6.20	4922	6039	40	96	1.15	-1.14	1.73	10.5	0.3
30	3500	580	6.05	4974	6082	39	91	1.10	-1.09	1.68	10.2	0.3
30	3500	600	5.91	5022	6121	39	86	1.06	-1.05	1.63	10.0	0.3
30	4000	400	8.52	4821	6264	47	170	1.80	-1.77	2.30	14.4	0.5
30	4000	420	8.29	4928	6347	46	159	1.69	-1.67	2.21	14.0	0.5
30	4000	440	8.08	5028	6425	45	150	1.60	-1.58	2.12	13.7	0.5
30	4000	460	7.87	5121	6498	44	141	1.51	-1.49	2.05	13.3	0.4
30	4000	480	7.67	5209	6568	44	132	1.43	-1.41	1.97	13.0	0.4
30	4000	500	7.48	5291	6633	43	125	1.36	-1.34	1.91	12.6	0.4
30	4000	520	7.30	5368	6694	42	118	1.29	-1.28	1.84	12.3	0.4
30	4000	540	7.12	5440	6752	42	111	1.23	-1.22	1.78	12.0	0.4
30	4000	560	6.96	5507	6806	41	106	1.18	-1.17	1.73	11.8	0.4
30	4000	580	6.80	5570	6858	41	100	1.13	-1.12	1.67	11.5	0.4
30	4000	600	6.65	5628	6905	40	95	1.08	-1.07	1.63	11.2	0.4

Figure 6-67 (Sheet 12 of 20)



# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	4500	400	9.34	5276	6934	48	184	1.83	-1.80	2.28	15.8	0.6
30	4500	420	9.11	5399	7028	47	172	1.72	-1.70	2.19	15.4	0.5
30	4500	440	8.98	5514	7117	46	162	1.63	-1.60	2.11	15.0	0.5
30	4500	460	8.86	5622	7201	46	152	1.54	-1.52	2.03	14.6	0.5
30	4500	480	8.75	5724	7281	45	144	1.46	-1.44	1.96	14.3	0.5
30	4500	500	8.65	5819	7356	44	136	1.38	-1.37	1.90	13.9	0.5
30	4500	520	8.56	5909	7427	43	128	1.32	-1.30	1.83	13.6	0.5
30	4500	540	8.47	5993	7494	43	121	1.26	-1.24	1.77	13.3	0.5
30	4500	560	8.39	6072	7558	42	115	1.20	-1.19	1.72	13.0	0.5
30	4500	580	8.32	6146	7617	41	109	1.15	-1.14	1.67	12.7	0.5
30	4500	600	8.27	6214	7672	41	104	1.10	-1.09	1.62	12.4	0.5
30	5000	400	10.14	5712	7591	50	196	1.86	-1.83	2.26	17.1	0.6
30	5000	420	9.89	5851	7696	48	185	1.75	-1.72	2.17	16.7	0.6
30	5000	440	9.66	5982	7796	48	174	1.65	-1.63	2.09	16.3	0.6
30	5000	460	9.43	6104	7891	47	164	1.56	-1.54	2.02	15.9	0.6
30	5000	480	9.21	6220	7980	46	154	1.48	-1.46	1.95	15.6	0.6
30	5000	500	9.00	6328	8065	45	146	1.41	-1.39	1.89	15.2	0.6
30	5000	520	8.79	6431	8146	44	138	1.34	-1.32	1.82	14.9	0.6
30	5000	540	8.60	6527	8222	44	131	1.28	-1.26	1.77	14.5	0.6
30	5000	560	8.41	6618	8295	43	124	1.22	-1.21	1.71	14.2	0.6
30	5000	580	8.23	6703	8363	42	118	1.17	-1.16	1.66	13.9	0.6
30	5000	600	8.07	6781	8425	42	112	1.12	-1.11	1.62	13.6	0.6
30	5500	400	10.91	6132	8237	51	208	1.88	-1.85	2.24	18.4	0.7
30	5500	420	10.65	6286	8353	50	196	1.77	-1.75	2.16	18.0	0.7
30	5500	440	10.41	6432	8463	49	185	1.67	-1.65	2.08	17.6	0.7
30	5500	460	10.17	6569	8568	48	174	1.58	-1.56	2.01	17.2	0.7
30	5500	480	9.94	6699	8667	47	165	1.50	-1.48	1.94	16.8	0.7
30	5500	500	9.72	6821	8762	46	156	1.43	-1.41	1.87	16.4	0.7
30	5500	520	9.51	6936	8852	45	148	1.36	-1.34	1.81	16.1	0.7
30	5500	540	9.30	7045	8938	45	140	1.30	-1.28	1.76	15.7	0.7
30	5500	560	9.10	7148	9019	44	133	1.24	-1.22	1.71	15.4	0.6
30	5500	580	8.92	7244	9095	43	127	1.19	-1.17	1.66	15.1	0.6
30	5500	600	8.75	7332	9165	43	121	1.14	-1.13	1.61	14.8	0.7
30	6000	400	11.65	6537	8873	52	220	1.91	-1.88	2.22	19.7	0.8
30	6000	420	11.39	6707	8999	51	207	1.80	-1.77	2.14	19.3	0.8
30	6000	440	11.14	6867	9119	50	195	1.70	-1.67	2.06	18.8	0.8
30	6000	460	10.89	7019	9234	49	185	1.60	-1.58	1.99	18.4	0.8
30	6000	480	10.65	7162	9343	48	175	1.52	-1.50	1.93	18.0	0.8
30	6000	500	10.42	7297	9447	47	165	1.45	-1.43	1.86	17.6	0.8
30	6000	520	10.20	7426	9547	46	157	1.38	-1.36	1.81	17.2	0.8
30	6000	540	9.99	7547	9641	45	149	1.31	-1.30	1.75	16.9	0.7
30	6000	560	9.78	7661	9731	45	141	1.26	-1.24	1.70	16.5	0.7
30	6000	580	9.59	7768	9816	44	135	1.20	-1.19	1.65	16.2	0.7
30	6000	600	9.42	7866	9893	44	129	1.16	-1.14	1.61	15.9	0.8
30	6500	400	12.38	6928	9500	53	231	1.93	-1.90	2.20	20.9	0.9
30	6500	420	12.11	7113	9636	51	218	1.82	-1.79	2.12	20.5	0.9
30	6500	440	11.84	7288	9766	50	206	1.72	-1.69	2.05	20.0	0.9
30	6500	460	11.59	7454	9890	49	194	1.62	-1.60	1.98	19.6	0.9
30	6500	480	11.35	7611	10009	49	184	1.54	-1.52	1.92	19.2	0.9
30	6500	500	11.11	7760	10122	48	174	1.46	-1.45	1.85	18.8	0.9
30	6500	520	10.88	7901	10231	47	166	1.39	-1.38	1.80	18.4	0.8
30	6500	540	10.66	8034	10334	46	157	1.33	-1.32	1.74	18.0	0.8
30	6500	560	10.45	8161	10433	46	150	1.27	-1.26	1.69	17.7	0.8
30	6500	580	10.25	8278	10525	45	143	1.22	-1.21	1.65	17.3	0.8
30	6500	600	10.08	8386	10610	44	136	1.17	-1.16	1.61	17.0	0.9
30	7000	400	13.08	7307	10119	53	241	1.95	-1.91	2.18	22.1	1.0
30	7000	420	12.80	7507	10264	52	228	1.83	-1.81	2.11	21.6	1.0
30	7000	440	12.53	7697	10404	51	215	1.73	-1.71	2.04	21.2	1.0
30	7000	460	12.27	7876	10537	50	204	1.64	-1.62	1.97	20.7	1.0
30	7000	480	12.02	8047	10666	49	193	1.56	-1.54	1.90	20.3	1.0
30	7000	500	11.78	8209	10788	49	183	1.48	-1.46	1.84	19.9	0.9
30	7000	520	11.54	8363	10906	48	174	1.41	-1.39	1.79	19.5	0.9
30	7000	540	11.31	8509	11018	47	165	1.35	-1.33	1.74	19.1	0.9
30	7000	560	11.10	8646	11125	46	158	1.29	-1.27	1.69	18.8	0.9
30	7000	580	10.90	8775	11225	46	150	1.23	-1.22	1.64	18.4	0.9
30	7000	600	10.72	8897	11317	45	144	1.19	-1.17	1.60	18.1	1.0

Figure 6-67 (Sheet 13 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	7500	400	13.76	7675	10731	54	251	1.96	-1.93	2.17	23.3	1.1
30	7500	420	13.48	7889	10885	53	237	1.85	-1.82	2.09	22.8	1.1
30	7500	440	13.20	8093	11034	52	225	1.75	-1.72	2.02	22.3	1.1
30	7500	460	12.94	8287	11177	51	213	1.66	-1.63	1.96	21.9	1.1
30	7500	480	12.68	8471	11314	50	202	1.57	-1.55	1.89	21.4	1.1
30	7500	500	12.43	8646	11446	49	192	1.50	-1.48	1.84	21.0	1.0
30	7500	520	12.19	8812	11572	49	182	1.43	-1.41	1.78	20.6	1.0
30	7500	540	11.95	8970	11693	48	173	1.36	-1.34	1.73	20.2	1.0
30	7500	560	11.73	9120	11808	47	165	1.30	-1.29	1.68	19.8	1.0
30	7500	580	11.53	9259	11915	46	158	1.25	-1.23	1.64	19.5	1.1
30	7500	600	11.36	9385	12014	46	151	1.20	-1.19	1.60	19.2	1.1
30	8000	400	14.43	8032	11337	55	261	1.98	-1.95	2.15	24.4	1.2
30	8000	420	14.14	8261	11500	54	246	1.87	-1.84	2.08	23.9	1.2
30	8000	440	13.86	8479	11658	53	233	1.76	-1.74	2.01	23.4	1.2
30	8000	460	13.59	8687	11809	52	221	1.67	-1.65	1.94	23.0	1.2
30	8000	480	13.32	8884	11955	51	210	1.59	-1.57	1.88	22.5	1.1
30	8000	500	13.07	9072	12095	50	200	1.51	-1.49	1.83	22.1	1.1
30	8000	520	12.82	9251	12230	49	190	1.44	-1.42	1.77	21.7	1.1
30	8000	540	12.58	9421	12359	48	181	1.37	-1.36	1.72	21.3	1.1
30	8000	560	12.36	9582	12482	48	173	1.32	-1.30	1.67	20.9	1.1
30	8000	580	12.16	9730	12597	47	165	1.26	-1.25	1.63	20.5	1.2
30	8000	600	11.96	9865	12701	47	158	1.22	-1.20	1.59	20.2	1.3
30	8500	400	15.08	8380	11936	56	270	1.99	-1.96	2.13	25.5	1.3
30	8500	420	14.78	8624	12109	55	255	1.88	-1.85	2.06	25.0	1.3
30	8500	440	14.50	8855	12275	54	242	1.78	-1.75	2.00	24.5	1.3
30	8500	460	14.22	9076	12435	53	230	1.69	-1.66	1.93	24.0	1.3
30	8500	480	13.95	9287	12589	52	218	1.60	-1.58	1.87	23.6	1.2
30	8500	500	13.69	9487	12738	51	208	1.52	-1.50	1.82	23.1	1.2
30	8500	520	13.44	9679	12881	50	198	1.45	-1.43	1.76	22.7	1.2
30	8500	540	13.20	9860	13018	49	188	1.39	-1.37	1.71	22.3	1.2
30	8500	560	12.97	10032	13149	48	180	1.33	-1.31	1.67	21.9	1.2
30	8500	580	12.77	10191	13270	48	172	1.28	-1.26	1.63	21.6	1.3
30	8500	600	12.60	10334	13381	47	165	1.23	-1.22	1.59	21.3	1.4
30	9000	400	15.71	8719	12531	56	278	2.00	-1.97	2.12	26.6	1.4
30	9000	420	15.42	8977	12711	55	264	1.89	-1.86	2.05	26.1	1.4
30	9000	440	15.13	9222	12886	54	250	1.79	-1.77	1.98	25.6	1.4
30	9000	460	14.84	9456	13055	53	238	1.70	-1.68	1.92	25.1	1.3
30	9000	480	14.57	9680	13217	52	226	1.61	-1.59	1.86	24.6	1.3
30	9000	500	14.30	9893	13374	51	215	1.54	-1.52	1.81	24.2	1.3
30	9000	520	14.05	10097	13526	51	205	1.47	-1.45	1.76	23.7	1.3
30	9000	540	13.80	10290	13671	50	196	1.40	-1.38	1.71	23.3	1.3
30	9000	560	13.57	10473	13809	49	187	1.34	-1.33	1.66	22.9	1.3
30	9000	580	13.37	10641	13936	48	179	1.29	-1.27	1.62	22.6	1.4
30	9000	600	13.20	10792	14052	48	172	1.24	-1.23	1.59	22.3	1.5
30	9500	400	16.34	9050	13121	57	287	2.02	-1.99	2.10	27.6	1.5
30	9500	420	16.03	9322	13309	56	272	1.91	-1.88	2.04	27.1	1.5
30	9500	440	15.74	9580	13492	55	258	1.80	-1.78	1.97	26.6	1.5
30	9500	460	15.45	9828	13669	54	245	1.71	-1.69	1.91	26.1	1.4
30	9500	480	15.17	10064	13840	53	234	1.63	-1.60	1.85	25.6	1.4
30	9500	500	14.90	10290	14005	52	222	1.55	-1.53	1.80	25.2	1.4
30	9500	520	14.64	10505	14164	51	212	1.48	-1.46	1.75	24.7	1.4
30	9500	540	14.40	10710	14316	50	203	1.41	-1.39	1.70	24.3	1.4
30	9500	560	14.17	10903	14461	50	194	1.35	-1.34	1.66	23.9	1.5
30	9500	580	13.97	11080	14595	49	186	1.30	-1.29	1.62	23.6	1.5
30	9500	600	13.80	11240	14717	49	179	1.26	-1.24	1.58	23.3	1.7
30	10000	400	16.94	9374	13707	58	295	2.03	-2.00	2.09	28.6	1.6
30	10000	420	16.64	9658	13903	57	280	1.92	-1.89	2.02	28.1	1.6
30	10000	440	16.34	9931	14093	56	266	1.82	-1.79	1.96	27.6	1.6
30	10000	460	16.05	10191	14278	55	253	1.72	-1.70	1.90	27.1	1.5
30	10000	480	15.77	10440	14457	54	241	1.64	-1.62	1.84	26.6	1.5
30	10000	500	15.49	10678	14629	53	230	1.56	-1.54	1.79	26.2	1.5
30	10000	520	15.23	10905	14796	52	219	1.49	-1.47	1.74	25.7	1.5
30	10000	540	14.98	11121	14956	51	209	1.42	-1.41	1.69	25.3	1.5
30	10000	560	14.76	11324	15108	50	200	1.36	-1.35	1.65	24.9	1.6
30	10000	580	14.56	11511	15248	50	192	1.31	-1.30	1.61	24.6	1.7
30	10000	600	14.39	11677	15374	49	185	1.27	-1.25	1.58	24.3	1.8

Figure 6-67 (Sheet 14 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	1500	400	3.09	1570	2171	47	67	1.83	-1.82	2.41	5.2	0.1
40	1500	420	2.97	1585	2182	46	62	1.73	-1.72	2.30	5.0	0.1
40	1500	440	2.86	1599	2192	46	58	1.64	-1.63	2.21	4.8	0.1
40	1500	460	2.76	1611	2201	45	54	1.56	-1.55	2.12	4.7	0.1
40	1500	480	2.66	1622	2210	45	51	1.48	-1.48	2.03	4.5	0.1
40	1500	500	2.57	1632	2217	45	47	1.42	-1.41	1.96	4.3	0.1
40	1500	520	2.48	1642	2224	44	45	1.36	-1.35	1.89	4.2	0.1
40	1500	540	2.40	1650	2230	44	42	1.30	-1.29	1.82	4.1	0.1
40	1500	560	2.33	1658	2236	44	40	1.25	-1.24	1.76	3.9	0.1
40	1500	580	2.26	1665	2241	44	38	1.20	-1.20	1.70	3.8	0.1
40	1500	600	2.19	1671	2246	43	36	1.16	-1.15	1.65	3.7	0.1
40	2000	400	4.01	2031	2851	48	82	1.88	-1.86	2.38	6.8	0.2
40	2000	420	3.87	2055	2868	48	76	1.77	-1.76	2.28	6.5	0.1
40	2000	440	3.73	2077	2883	47	70	1.68	-1.67	2.19	6.3	0.1
40	2000	460	3.60	2096	2897	47	66	1.59	-1.58	2.10	6.1	0.1
40	2000	480	3.48	2114	2910	46	61	1.52	-1.51	2.02	5.9	0.1
40	2000	500	3.36	2130	2922	46	58	1.45	-1.44	1.94	5.7	0.1
40	2000	520	3.25	2145	2933	45	54	1.38	-1.38	1.88	5.5	0.1
40	2000	540	3.15	2158	2943	45	51	1.33	-1.32	1.81	5.3	0.1
40	2000	560	3.06	2171	2952	45	48	1.27	-1.27	1.75	5.2	0.1
40	2000	580	2.97	2182	2960	44	45	1.22	-1.22	1.69	5.0	0.1
40	2000	600	2.88	2193	2968	44	43	1.18	-1.17	1.64	4.9	0.1
40	2500	400	4.89	2469	3514	49	95	1.92	-1.90	2.35	8.3	0.2
40	2500	420	4.72	2503	3537	49	88	1.81	-1.79	2.26	8.0	0.2
40	2500	440	4.56	2533	3559	48	82	1.71	-1.70	2.17	7.7	0.2
40	2500	460	4.41	2560	3579	48	77	1.63	-1.61	2.08	7.5	0.2
40	2500	480	4.27	2586	3597	47	72	1.55	-1.54	2.00	7.2	0.2
40	2500	500	4.13	2609	3613	47	68	1.48	-1.47	1.93	7.0	0.2
40	2500	520	4.00	2630	3629	46	63	1.41	-1.40	1.86	6.8	0.2
40	2500	540	3.88	2649	3643	46	60	1.35	-1.34	1.80	6.6	0.2
40	2500	560	3.77	2667	3656	46	56	1.30	-1.29	1.74	6.4	0.1
40	2500	580	3.66	2684	3668	45	53	1.24	-1.24	1.69	6.2	0.1
40	2500	600	3.56	2699	3679	45	51	1.20	-1.19	1.64	6.0	0.1
40	3000	400	5.74	2887	4163	51	108	1.95	-1.93	2.33	9.7	0.3
40	3000	420	5.54	2930	4194	50	100	1.84	-1.83	2.23	9.4	0.3
40	3000	440	5.36	2970	4221	49	94	1.74	-1.73	2.15	9.1	0.2
40	3000	460	5.19	3006	4247	49	88	1.66	-1.64	2.06	8.8	0.2
40	3000	480	5.03	3040	4271	48	82	1.57	-1.56	1.99	8.5	0.2
40	3000	500	4.87	3070	4293	48	77	1.50	-1.49	1.92	8.2	0.2
40	3000	520	4.73	3098	4313	47	72	1.43	-1.43	1.85	8.0	0.2
40	3000	540	4.59	3124	4331	47	68	1.37	-1.36	1.79	7.8	0.2
40	3000	560	4.46	3148	4349	47	64	1.32	-1.31	1.73	7.5	0.2
40	3000	580	4.34	3170	4365	46	61	1.26	-1.26	1.68	7.3	0.2
40	3000	600	4.22	3190	4379	46	58	1.22	-1.21	1.63	7.1	0.2
40	3500	400	6.55	3287	4801	52	120	1.98	-1.96	2.30	11.1	0.3
40	3500	420	6.34	3341	4838	51	112	1.87	-1.86	2.21	10.7	0.3
40	3500	440	6.14	3390	4873	51	105	1.77	-1.76	2.13	10.4	0.3
40	3500	460	5.95	3435	4904	50	98	1.68	-1.67	2.05	10.0	0.3
40	3500	480	5.77	3477	4934	49	92	1.60	-1.59	1.98	9.7	0.3
40	3500	500	5.60	3516	4961	49	86	1.52	-1.51	1.91	9.5	0.3
40	3500	520	5.43	3551	4986	48	81	1.46	-1.45	1.84	9.2	0.3
40	3500	540	5.28	3584	5010	48	77	1.39	-1.38	1.78	8.9	0.3
40	3500	560	5.14	3615	5032	47	72	1.34	-1.33	1.72	8.7	0.3
40	3500	580	5.00	3643	5052	47	68	1.28	-1.28	1.67	8.4	0.2
40	3500	600	4.87	3669	5070	47	65	1.23	-1.23	1.62	8.2	0.2
40	4000	400	7.33	3671	5429	53	131	2.01	-1.99	2.28	12.4	0.4
40	4000	420	7.10	3735	5473	52	123	1.90	-1.88	2.19	12.0	0.4
40	4000	440	6.89	3795	5514	52	115	1.80	-1.78	2.11	11.6	0.4
40	4000	460	6.68	3850	5552	51	108	1.71	-1.69	2.03	11.3	0.4
40	4000	480	6.48	3900	5587	50	101	1.62	-1.61	1.96	11.0	0.4
40	4000	500	6.30	3947	5620	50	95	1.55	-1.53	1.89	10.6	0.3
40	4000	520	6.12	3991	5650	49	89	1.48	-1.47	1.83	10.3	0.3
40	4000	540	5.95	4031	5679	49	84	1.41	-1.40	1.77	10.1	0.3
40	4000	560	5.79	4068	5705	48	80	1.35	-1.35	1.72	9.8	0.3
40	4000	580	5.64	4103	5730	48	76	1.30	-1.29	1.66	9.5	0.3
40	4000	600	5.51	4134	5753	47	72	1.25	-1.24	1.62	9.3	0.3

Figure 6-67 (Sheet 15 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	4500	400	8.09	4040	6049	54	142	2.04	-2.02	2.26	13.7	0.5
40	4500	420	7.84	4116	6098	53	133	1.92	-1.90	2.17	13.3	0.5
40	4500	440	7.61	4186	6146	52	125	1.82	-1.80	2.09	12.9	0.4
40	4500	460	7.39	4250	6190	52	117	1.73	-1.71	2.02	12.5	0.4
40	4500	480	7.18	4310	6231	51	110	1.64	-1.63	1.95	12.1	0.4
40	4500	500	6.98	4366	6270	51	103	1.57	-1.55	1.88	11.8	0.4
40	4500	520	6.79	4417	6306	50	98	1.50	-1.48	1.82	11.5	0.4
40	4500	540	6.61	4465	6339	49	92	1.43	-1.42	1.76	11.2	0.4
40	4500	560	6.44	4510	6371	49	87	1.37	-1.36	1.71	10.9	0.4
40	4500	580	6.28	4551	6400	49	83	1.32	-1.31	1.66	10.6	0.4
40	4500	600	6.13	4589	6427	48	78	1.27	-1.26	1.61	10.4	0.4
40	5000	400	8.82	4397	6658	55	152	2.06	-2.04	2.24	14.9	0.6
40	5000	420	8.56	4484	6716	54	143	1.95	-1.92	2.15	14.5	0.5
40	5000	440	8.32	4564	6770	53	134	1.84	-1.82	2.08	14.1	0.5
40	5000	460	8.09	4639	6820	53	126	1.75	-1.73	2.00	13.7	0.5
40	5000	480	7.86	4708	6868	52	118	1.66	-1.65	1.94	13.3	0.5
40	5000	500	7.65	4772	6912	51	111	1.58	-1.57	1.87	12.9	0.5
40	5000	520	7.45	4832	6953	51	105	1.51	-1.50	1.81	12.6	0.5
40	5000	540	7.26	4888	6992	50	99	1.45	-1.44	1.75	12.3	0.4
40	5000	560	7.07	4940	7029	50	94	1.39	-1.38	1.70	12.0	0.4
40	5000	580	6.90	4988	7063	49	89	1.33	-1.32	1.65	11.7	0.4
40	5000	600	6.74	5032	7094	49	85	1.28	-1.27	1.61	11.4	0.4
40	5500	400	9.53	4742	7262	56	162	2.08	-2.06	2.22	16.1	0.6
40	5500	420	9.26	4840	7326	55	152	1.96	-1.94	2.14	15.7	0.6
40	5500	440	9.01	4931	7387	54	143	1.86	-1.84	2.06	15.2	0.6
40	5500	460	8.76	5015	7443	53	134	1.77	-1.75	1.99	14.8	0.6
40	5500	480	8.53	5094	7497	53	126	1.68	-1.66	1.92	14.4	0.6
40	5500	500	8.30	5167	7547	52	119	1.60	-1.59	1.86	14.0	0.5
40	5500	520	8.09	5236	7594	51	113	1.53	-1.52	1.80	13.7	0.5
40	5500	540	7.89	5300	7638	51	107	1.46	-1.45	1.74	13.3	0.5
40	5500	560	7.69	5359	7679	50	101	1.40	-1.39	1.69	13.0	0.5
40	5500	580	7.51	5414	7718	50	96	1.35	-1.34	1.64	12.7	0.5
40	5500	600	7.35	5465	7753	49	91	1.30	-1.29	1.60	12.4	0.5
40	6000	400	10.22	5077	7860	57	171	2.10	-2.08	2.20	17.3	0.7
40	6000	420	9.94	5186	7930	56	161	1.98	-1.96	2.12	16.8	0.7
40	6000	440	9.68	5287	7997	55	151	1.88	-1.86	2.05	16.4	0.7
40	6000	460	9.42	5382	8060	54	142	1.78	-1.77	1.98	15.9	0.6
40	6000	480	9.18	5470	8119	53	134	1.70	-1.68	1.91	15.5	0.6
40	6000	500	8.94	5552	8175	53	127	1.62	-1.60	1.85	15.1	0.6
40	6000	520	8.72	5630	8228	52	120	1.54	-1.53	1.79	14.7	0.6
40	6000	540	8.50	5702	8277	52	114	1.48	-1.47	1.74	14.4	0.6
40	6000	560	8.30	5769	8323	51	108	1.42	-1.41	1.69	14.0	0.6
40	6000	580	8.11	5831	8367	51	102	1.36	-1.35	1.64	13.7	0.6
40	6000	600	7.94	5887	8406	50	97	1.31	-1.30	1.60	13.4	0.6
40	6500	400	10.90	5401	8451	57	180	2.12	-2.09	2.18	18.4	0.8
40	6500	420	10.61	5521	8529	57	169	2.00	-1.98	2.10	17.9	0.8
40	6500	440	10.33	5634	8602	56	159	1.89	-1.87	2.03	17.5	0.7
40	6500	460	10.07	5738	8670	55	150	1.80	-1.78	1.96	17.0	0.7
40	6500	480	9.81	5836	8736	54	142	1.71	-1.70	1.90	16.6	0.7
40	6500	500	9.57	5928	8797	53	134	1.63	-1.62	1.84	16.2	0.7
40	6500	520	9.33	6014	8855	53	127	1.56	-1.55	1.78	15.8	0.7
40	6500	540	9.11	6094	8910	52	120	1.49	-1.48	1.73	15.4	0.7
40	6500	560	8.90	6169	8961	52	114	1.43	-1.42	1.68	15.0	0.7
40	6500	580	8.70	6238	9009	51	109	1.37	-1.36	1.63	14.7	0.7
40	6500	600	8.53	6301	9053	51	103	1.32	-1.32	1.59	14.4	0.7
40	7000	400	11.56	5717	9038	58	189	2.13	-2.11	2.16	19.5	0.9
40	7000	420	11.26	5848	9122	57	177	2.01	-1.99	2.09	19.0	0.8
40	7000	440	10.97	5971	9201	56	167	1.91	-1.89	2.02	18.5	0.8
40	7000	460	10.70	6086	9276	56	158	1.81	-1.80	1.95	18.1	0.8
40	7000	480	10.43	6193	9347	55	149	1.73	-1.71	1.89	17.6	0.8
40	7000	500	10.18	6294	9414	54	141	1.65	-1.63	1.83	17.2	0.8
40	7000	520	9.94	6389	9477	53	134	1.57	-1.56	1.77	16.8	0.8
40	7000	540	9.70	6478	9537	53	127	1.50	-1.49	1.72	16.4	0.7
40	7000	560	9.48	6561	9594	52	120	1.44	-1.43	1.67	16.0	0.7
40	7000	580	9.28	6637	9646	52	115	1.39	-1.38	1.63	15.7	0.8
40	7000	600	9.11	6706	9694	51	109	1.34	-1.33	1.59	15.4	0.8

**Figure 6-67 (Sheet 16 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	7500	400	12.20	6025	9620	59	197	2.14	-2.12	2.14	20.6	1.0
40	7500	420	11.89	6167	9710	58	185	2.03	-2.01	2.07	20.1	0.9
40	7500	440	11.60	6300	9795	57	175	1.92	-1.90	2.00	19.6	0.9
40	7500	460	11.31	6425	9876	56	165	1.83	-1.81	1.94	19.1	0.9
40	7500	480	11.04	6542	9952	55	156	1.74	-1.72	1.87	18.7	0.9
40	7500	500	10.78	6652	10025	55	148	1.66	-1.64	1.82	18.2	0.8
40	7500	520	10.53	6756	10094	54	140	1.58	-1.57	1.76	17.8	0.8
40	7500	540	10.29	6853	10159	53	133	1.52	-1.50	1.71	17.4	0.8
40	7500	560	10.06	6944	10221	53	126	1.45	-1.44	1.66	17.0	0.8
40	7500	580	9.86	7027	10278	52	120	1.40	-1.39	1.62	16.7	0.8
40	7500	600	9.68	7102	10329	52	115	1.35	-1.34	1.59	16.4	0.9
40	8000	400	12.83	6325	10198	59	204	2.16	-2.13	2.13	21.7	1.0
40	8000	420	12.51	6477	10294	59	193	2.04	-2.02	2.05	21.1	1.0
40	8000	440	12.21	6621	10385	58	182	1.94	-1.91	1.99	20.6	1.0
40	8000	460	11.92	6756	10471	57	172	1.84	-1.82	1.92	20.1	1.0
40	8000	480	11.64	6883	10554	56	163	1.75	-1.73	1.86	19.7	0.9
40	8000	500	11.37	7003	10632	55	154	1.67	-1.65	1.81	19.2	0.9
40	8000	520	11.11	7115	10706	55	146	1.60	-1.58	1.75	18.8	0.9
40	8000	540	10.86	7220	10777	54	139	1.53	-1.51	1.70	18.4	0.9
40	8000	560	10.63	7319	10843	53	132	1.47	-1.45	1.66	18.0	0.9
40	8000	580	10.43	7409	10904	53	126	1.41	-1.40	1.62	17.6	0.9
40	8000	600	10.24	7490	10959	52	121	1.36	-1.35	1.58	17.3	1.0
40	8500	400	13.44	6617	10772	60	212	2.17	-2.14	2.11	22.7	1.1
40	8500	420	13.12	6781	10873	59	200	2.05	-2.03	2.04	22.2	1.1
40	8500	440	12.81	6935	10970	58	189	1.95	-1.93	1.97	21.7	1.1
40	8500	460	12.51	7080	11062	57	179	1.85	-1.83	1.91	21.1	1.1
40	8500	480	12.22	7217	11150	57	169	1.76	-1.74	1.85	20.7	1.0
40	8500	500	11.95	7345	11234	56	161	1.68	-1.67	1.80	20.2	1.0
40	8500	520	11.68	7467	11314	55	153	1.61	-1.59	1.74	19.7	1.0
40	8500	540	11.43	7580	11389	55	145	1.54	-1.53	1.70	19.3	1.0
40	8500	560	11.19	7687	11460	54	138	1.48	-1.46	1.65	18.9	1.0
40	8500	580	10.98	7784	11525	53	132	1.42	-1.41	1.61	18.6	1.0
40	8500	600	10.80	7871	11584	53	126	1.37	-1.36	1.58	18.3	1.1
40	9000	400	14.05	6903	11342	61	219	2.18	-2.16	2.09	23.7	1.2
40	9000	420	13.72	7078	11450	60	207	2.06	-2.04	2.02	23.2	1.2
40	9000	440	13.40	7242	11552	59	196	1.96	-1.94	1.96	22.6	1.2
40	9000	460	13.09	7397	11650	58	185	1.86	-1.84	1.90	22.1	1.1
40	9000	480	12.80	7543	11743	57	176	1.77	-1.76	1.84	21.6	1.1
40	9000	500	12.51	7681	11832	56	167	1.69	-1.68	1.79	21.2	1.1
40	9000	520	12.24	7811	11917	56	158	1.62	-1.60	1.74	20.7	1.1
40	9000	540	11.99	7933	11997	55	151	1.55	-1.54	1.69	20.3	1.1
40	9000	560	11.75	8047	12073	55	144	1.49	-1.47	1.64	19.9	1.1
40	9000	580	11.54	8151	12142	54	137	1.43	-1.42	1.61	19.5	1.2
40	9000	600	11.35	8244	12205	54	132	1.39	-1.37	1.57	19.2	1.2
40	9500	400	14.64	7183	11910	61	226	2.19	-2.16	2.08	24.7	1.3
40	9500	420	14.30	7368	12022	60	214	2.07	-2.05	2.01	24.2	1.3
40	9500	440	13.98	7543	12130	59	202	1.97	-1.95	1.95	23.6	1.2
40	9500	460	13.67	7708	12233	59	192	1.87	-1.85	1.89	23.1	1.2
40	9500	480	13.36	7863	12332	58	182	1.78	-1.77	1.83	22.6	1.2
40	9500	500	13.07	8010	12426	57	173	1.70	-1.69	1.78	22.1	1.2
40	9500	520	12.80	8149	12516	56	164	1.63	-1.61	1.73	21.6	1.2
40	9500	540	12.54	8280	12602	56	156	1.56	-1.55	1.68	21.2	1.2
40	9500	560	12.30	8401	12682	55	149	1.50	-1.48	1.64	20.8	1.2
40	9500	580	12.09	8511	12755	55	143	1.44	-1.43	1.60	20.4	1.3
40	9500	600	11.90	8610	12821	54	137	1.40	-1.39	1.57	20.1	1.4
40	10000	400	15.22	7456	12474	62	233	2.20	-2.17	2.06	25.7	1.4
40	10000	420	14.88	7652	12592	61	220	2.08	-2.06	2.00	25.1	1.4
40	10000	440	14.55	7837	12705	60	209	1.98	-1.96	1.93	24.6	1.3
40	10000	460	14.23	8012	12814	59	198	1.88	-1.86	1.88	24.0	1.3
40	10000	480	13.92	8177	12918	58	188	1.79	-1.77	1.82	23.5	1.3
40	10000	500	13.62	8333	13017	58	178	1.71	-1.69	1.77	23.0	1.3
40	10000	520	13.34	8481	13112	57	170	1.64	-1.62	1.72	22.6	1.3
40	10000	540	13.08	8619	13202	56	162	1.57	-1.55	1.67	22.1	1.3
40	10000	560	12.84	8748	13286	56	154	1.51	-1.49	1.63	21.7	1.3
40	10000	580	12.63	8865	13363	55	148	1.45	-1.44	1.60	21.3	1.4
40	10000	600	12.44	8969	13433	55	142	1.41	-1.40	1.57	21.0	1.5

Figure 6-67 (Sheet 17 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	1500	400	2.86	1339	2011	51	59	1.95	-1.94	2.40	4.8	0.1
45	1500	420	2.75	1350	2018	50	55	1.85	-1.84	2.30	4.6	0.1
45	1500	440	2.64	1361	2025	50	51	1.75	-1.75	2.20	4.5	0.1
45	1500	460	2.54	1370	2031	50	48	1.67	-1.66	2.11	4.3	0.1
45	1500	480	2.45	1378	2037	49	45	1.59	-1.59	2.03	4.1	0.1
45	1500	500	2.36	1386	2042	49	42	1.52	-1.52	1.96	4.0	0.1
45	1500	520	2.28	1393	2047	49	40	1.46	-1.45	1.89	3.9	0.1
45	1500	540	2.21	1399	2051	48	37	1.40	-1.40	1.82	3.7	0.1
45	1500	560	2.14	1405	2055	48	35	1.35	-1.34	1.76	3.6	0.1
45	1500	580	2.07	1410	2059	48	33	1.30	-1.29	1.70	3.5	0.1
45	1500	600	2.01	1415	2062	48	32	1.25	-1.25	1.65	3.4	0.1
45	2000	400	3.73	1735	2650	52	72	1.99	-1.98	2.38	6.3	0.1
45	2000	420	3.55	1757	2662	51	67	1.88	-1.87	2.28	6.1	0.1
45	2000	440	3.45	1774	2673	51	62	1.79	-1.78	2.18	5.8	0.1
45	2000	460	3.33	1788	2683	51	58	1.70	-1.69	2.10	5.6	0.1
45	2000	480	3.21	1802	2692	50	54	1.62	-1.61	2.02	5.4	0.1
45	2000	500	3.10	1814	2700	50	51	1.55	-1.54	1.94	5.2	0.1
45	2000	520	3.00	1825	2707	50	48	1.48	-1.48	1.87	5.1	0.1
45	2000	540	2.91	1835	2714	49	45	1.42	-1.42	1.81	4.9	0.1
45	2000	560	2.81	1844	2720	49	42	1.37	-1.36	1.75	4.8	0.1
45	2000	580	2.73	1853	2726	49	40	1.31	-1.31	1.69	4.6	0.1
45	2000	600	2.65	1860	2731	49	38	1.27	-1.26	1.64	4.5	0.1
45	2500	400	4.56	2121	3279	53	84	2.03	-2.01	2.35	7.7	0.2
45	2500	420	4.39	2147	3295	53	78	1.92	-1.90	2.25	7.4	0.2
45	2500	440	4.24	2170	3310	52	72	1.82	-1.81	2.16	7.2	0.2
45	2500	460	4.09	2191	3324	52	67	1.73	-1.72	2.08	6.9	0.2
45	2500	480	3.95	2210	3337	51	63	1.65	-1.64	2.00	6.7	0.2
45	2500	500	3.82	2227	3348	51	59	1.57	-1.56	1.93	6.5	0.2
45	2500	520	3.70	2243	3359	51	56	1.50	-1.50	1.86	6.3	0.2
45	2500	540	3.58	2258	3369	50	52	1.44	-1.44	1.80	6.1	0.1
45	2500	560	3.48	2271	3378	50	49	1.39	-1.38	1.74	5.9	0.1
45	2500	580	3.37	2284	3386	50	47	1.33	-1.33	1.68	5.7	0.1
45	2500	600	3.28	2295	3393	49	44	1.28	-1.28	1.63	5.5	0.1
45	3000	400	5.36	2488	3897	54	95	2.06	-2.04	2.32	9.1	0.3
45	3000	420	5.17	2521	3919	54	88	1.94	-1.93	2.23	8.7	0.2
45	3000	440	4.99	2552	3938	53	82	1.84	-1.83	2.14	8.4	0.2
45	3000	460	4.83	2579	3956	53	77	1.75	-1.74	2.06	8.2	0.2
45	3000	480	4.67	2605	3973	52	72	1.67	-1.66	1.99	7.9	0.2
45	3000	500	4.52	2628	3988	52	67	1.59	-1.59	1.92	7.6	0.2
45	3000	520	4.38	2649	4002	51	63	1.52	-1.52	1.85	7.4	0.2
45	3000	540	4.25	2669	4015	51	60	1.46	-1.45	1.79	7.2	0.2
45	3000	560	4.12	2687	4027	51	56	1.40	-1.40	1.73	7.0	0.2
45	3000	580	4.01	2703	4038	50	53	1.35	-1.34	1.68	6.8	0.2
45	3000	600	3.90	2718	4048	50	51	1.30	-1.30	1.63	6.6	0.2
45	3500	400	6.13	2839	4507	55	105	2.08	-2.07	2.30	10.4	0.3
45	3500	420	5.92	2881	4534	55	98	1.97	-1.95	2.21	10.0	0.3
45	3500	440	5.73	2920	4558	54	91	1.87	-1.85	2.12	9.7	0.3
45	3500	460	5.54	2955	4581	54	86	1.77	-1.76	2.04	9.4	0.3
45	3500	480	5.37	2987	4601	53	80	1.69	-1.68	1.97	9.1	0.3
45	3500	500	5.20	3017	4621	53	75	1.61	-1.60	1.90	8.8	0.3
45	3500	520	5.05	3044	4638	52	71	1.54	-1.54	1.84	8.5	0.2
45	3500	540	4.90	3069	4655	52	67	1.48	-1.47	1.78	8.3	0.2
45	3500	560	4.76	3092	4670	51	63	1.42	-1.41	1.72	8.0	0.2
45	3500	580	4.62	3113	4684	51	60	1.36	-1.36	1.67	7.8	0.2
45	3500	600	4.50	3132	4697	51	57	1.32	-1.31	1.62	7.6	0.2
45	4000	400	6.88	3179	5109	56	115	2.11	-2.09	2.28	11.6	0.4
45	4000	420	6.65	3229	5141	56	107	1.99	-1.98	2.19	11.2	0.4
45	4000	440	6.44	3276	5170	55	100	1.89	-1.87	2.11	10.9	0.4
45	4000	460	6.24	3319	5197	54	94	1.80	-1.78	2.03	10.5	0.3
45	4000	480	6.05	3358	5223	54	88	1.71	-1.70	1.96	10.2	0.3
45	4000	500	5.87	3394	5246	53	83	1.63	-1.62	1.89	9.9	0.3
45	4000	520	5.70	3427	5267	53	78	1.56	-1.55	1.83	9.6	0.3
45	4000	540	5.53	3458	5287	52	74	1.50	-1.49	1.77	9.3	0.3
45	4000	560	5.38	3486	5306	52	70	1.44	-1.43	1.71	9.1	0.3
45	4000	580	5.23	3512	5323	52	66	1.38	-1.37	1.66	8.8	0.3
45	4000	600	5.10	3536	5339	51	62	1.33	-1.32	1.61	8.6	0.3

**Figure 6-67 (Sheet 18 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	4500	400	7.61	3506	5705	57	125	2.13	-2.11	2.25	12.9	0.5
45	4500	420	7.36	3566	5742	56	116	2.01	-2.00	2.17	12.4	0.4
45	4500	440	7.14	3621	5776	56	109	1.91	-1.89	2.09	12.1	0.4
45	4500	460	6.92	3671	5808	55	102	1.81	-1.80	2.01	11.7	0.4
45	4500	480	6.71	3718	5837	55	96	1.73	-1.72	1.94	11.3	0.4
45	4500	500	6.52	3761	5865	54	90	1.65	-1.64	1.88	11.0	0.4
45	4500	520	6.33	3801	5890	54	85	1.58	-1.57	1.82	10.7	0.4
45	4500	540	6.15	3837	5914	53	80	1.51	-1.50	1.76	10.4	0.3
45	4500	560	5.99	3872	5936	53	76	1.45	-1.44	1.70	10.1	0.3
45	4500	580	5.83	3903	5957	52	72	1.39	-1.39	1.65	9.9	0.3
45	4500	600	5.69	3932	5976	52	68	1.34	-1.34	1.61	9.6	0.3
45	5000	400	8.31	3823	6294	58	134	2.15	-2.13	2.23	14.0	0.5
45	5000	420	8.05	3892	6336	57	125	2.03	-2.01	2.15	13.6	0.5
45	5000	440	7.81	3956	6376	57	117	1.93	-1.91	2.07	13.2	0.5
45	5000	460	7.59	4014	6412	56	110	1.83	-1.82	2.00	12.8	0.5
45	5000	480	7.36	4068	6446	55	103	1.74	-1.73	1.93	12.4	0.5
45	5000	500	7.15	4119	6478	55	97	1.66	-1.65	1.87	12.1	0.4
45	5000	520	6.95	4165	6507	54	92	1.59	-1.58	1.81	11.8	0.4
45	5000	540	6.76	4208	6535	54	87	1.53	-1.52	1.75	11.4	0.4
45	5000	560	6.58	4248	6561	53	82	1.46	-1.46	1.70	11.1	0.4
45	5000	580	6.42	4285	6585	53	78	1.41	-1.40	1.65	10.8	0.4
45	5000	600	6.26	4318	6607	53	74	1.36	-1.35	1.60	10.6	0.4
45	5500	400	9.00	4131	6878	59	142	2.17	-2.15	2.21	15.2	0.6
45	5500	420	8.73	4209	6926	58	133	2.05	-2.03	2.13	14.8	0.6
45	5500	440	8.47	4281	6970	57	125	1.94	-1.93	2.05	14.3	0.6
45	5500	460	8.23	4348	7011	57	117	1.85	-1.83	1.98	13.9	0.5
45	5500	480	8.00	4410	7050	56	110	1.76	-1.75	1.92	13.5	0.5
45	5500	500	7.78	4467	7086	55	104	1.68	-1.67	1.85	13.1	0.5
45	5500	520	7.56	4521	7119	55	98	1.61	-1.60	1.80	12.8	0.5
45	5500	540	7.36	4570	7151	54	93	1.54	-1.53	1.74	12.4	0.5
45	5500	560	7.17	4616	7180	54	88	1.48	-1.47	1.69	12.1	0.5
45	5500	580	7.00	4658	7208	54	83	1.42	-1.41	1.64	11.8	0.5
45	5500	600	6.84	4697	7233	53	79	1.37	-1.36	1.60	11.6	0.5
45	6000	400	9.67	4429	7458	60	150	2.18	-2.16	2.19	16.3	0.7
45	6000	420	9.39	4517	7510	59	141	2.07	-2.05	2.11	15.9	0.7
45	6000	440	9.12	4598	7559	58	132	1.96	-1.94	2.04	15.4	0.6
45	6000	460	8.86	4673	7605	57	125	1.86	-1.85	1.97	15.0	0.6
45	6000	480	8.62	4743	7648	57	117	1.77	-1.76	1.90	14.6	0.6
45	6000	500	8.38	4808	7689	56	111	1.69	-1.68	1.84	14.2	0.6
45	6000	520	8.16	4868	7726	56	105	1.62	-1.61	1.79	13.8	0.6
45	6000	540	7.95	4924	7762	55	99	1.55	-1.54	1.73	13.4	0.5
45	6000	560	7.75	4976	7795	55	94	1.49	-1.48	1.68	13.1	0.5
45	6000	580	7.57	5024	7826	54	89	1.43	-1.42	1.63	12.8	0.5
45	6000	600	7.40	5068	7854	54	85	1.38	-1.37	1.59	12.5	0.6
45	6500	400	10.32	4720	8033	60	158	2.20	-2.18	2.17	17.4	0.8
45	6500	420	10.03	4817	8090	59	149	2.08	-2.06	2.09	16.9	0.7
45	6500	440	9.75	4906	8144	59	140	1.97	-1.96	2.02	16.5	0.7
45	6500	460	9.48	4990	8194	58	131	1.88	-1.86	1.96	16.0	0.7
45	6500	480	9.23	5068	8242	57	124	1.79	-1.77	1.89	15.6	0.7
45	6500	500	8.98	5140	8287	57	117	1.71	-1.69	1.83	15.2	0.6
45	6500	520	8.75	5208	8329	56	111	1.63	-1.62	1.78	14.8	0.6
45	6500	540	8.53	5271	8368	56	105	1.56	-1.55	1.72	14.4	0.6
45	6500	560	8.32	5329	8405	55	99	1.50	-1.49	1.67	14.1	0.6
45	6500	580	8.13	5383	8439	55	94	1.44	-1.44	1.63	13.7	0.6
45	6500	600	7.96	5431	8470	54	90	1.39	-1.39	1.59	13.4	0.6
45	7000	400	10.96	5003	8604	61	166	2.21	-2.19	2.15	18.5	0.8
45	7000	420	10.66	5109	8666	60	156	2.09	-2.07	2.08	18.0	0.8
45	7000	440	10.37	5208	8725	59	147	1.99	-1.97	2.01	17.5	0.8
45	7000	460	10.09	5300	8780	59	138	1.89	-1.87	1.94	17.1	0.8
45	7000	480	9.82	5385	8832	58	130	1.80	-1.79	1.88	16.6	0.7
45	7000	500	9.57	5465	8891	57	123	1.72	-1.71	1.82	16.2	0.7
45	7000	520	9.33	5540	8927	57	117	1.64	-1.63	1.77	15.8	0.7
45	7000	540	9.10	5610	8971	56	111	1.57	-1.56	1.71	15.4	0.7
45	7000	560	8.88	5675	9011	56	105	1.51	-1.50	1.67	15.0	0.7
45	7000	580	8.68	5734	9049	55	100	1.46	-1.45	1.62	14.7	0.7
45	7000	600	8.51	5788	9083	55	95	1.41	-1.40	1.58	14.4	0.7

Figure 6-67 (Sheet 19 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (PM-3)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	7500	400	11.58	5279	9171	61	173	2.22	-2.20	2.13	19.6	0.9
45	7500	420	11.27	5394	9238	61	163	2.11	-2.09	2.06	19.0	0.9
45	7500	440	10.97	5502	9302	60	153	2.00	-1.98	1.99	18.5	0.9
45	7500	460	10.66	5602	9361	59	145	1.90	-1.88	1.93	18.1	0.8
45	7500	480	10.41	5696	9418	58	137	1.81	-1.80	1.87	17.6	0.8
45	7500	500	10.15	5784	9471	58	129	1.73	-1.72	1.81	17.1	0.8
45	7500	520	9.90	5866	9521	57	122	1.65	-1.64	1.76	16.7	0.8
45	7500	540	9.66	5942	9569	57	116	1.59	-1.57	1.71	16.3	0.8
45	7500	560	9.43	6014	9613	56	110	1.52	-1.51	1.66	15.9	0.8
45	7500	580	9.23	6079	9654	56	105	1.47	-1.46	1.62	15.6	0.8
45	7500	600	9.05	6138	9691	55	100	1.42	-1.41	1.58	15.3	0.8
45	8000	400	12.19	5546	9735	62	180	2.23	-2.21	2.12	20.6	1.0
45	8000	420	11.87	5673	9807	61	169	2.12	-2.10	2.05	20.1	1.0
45	8000	440	11.56	5789	9875	60	160	2.01	-1.99	1.98	19.5	0.9
45	8000	460	11.27	5898	9939	60	151	1.91	-1.90	1.92	19.0	0.9
45	8000	480	10.99	6000	10000	59	143	1.82	-1.81	1.86	18.6	0.9
45	8000	500	10.71	6096	10058	58	135	1.74	-1.73	1.80	18.1	0.9
45	8000	520	10.45	6185	10112	58	128	1.66	-1.65	1.75	17.7	0.8
45	8000	540	10.21	6269	10163	57	121	1.60	-1.58	1.70	17.3	0.8
45	8000	560	9.98	6346	10211	57	115	1.53	-1.52	1.65	16.9	0.8
45	8000	580	9.77	6417	10256	56	110	1.48	-1.47	1.61	16.5	0.9
45	8000	600	9.59	6481	10296	56	105	1.43	-1.42	1.57	16.2	0.9
45	8500	400	12.79	5811	10297	63	196	2.25	-2.22	2.10	21.6	1.1
45	8500	420	12.46	5945	10373	62	176	2.13	-2.11	2.03	21.1	1.0
45	8500	440	12.15	6071	10445	61	166	2.02	-2.00	1.97	20.5	1.0
45	8500	460	11.84	6198	10514	60	157	1.92	-1.91	1.90	20.0	1.0
45	8500	480	11.55	6328	10579	60	148	1.83	-1.82	1.85	19.5	1.0
45	8500	500	11.27	6451	10641	59	141	1.75	-1.74	1.79	19.0	0.9
45	8500	520	11.00	6568	10699	58	133	1.67	-1.66	1.74	18.6	0.9
45	8500	540	10.75	6679	10755	58	127	1.61	-1.59	1.69	18.2	0.9
45	8500	560	10.52	6783	10806	57	120	1.54	-1.53	1.64	17.8	0.9
45	8500	580	10.31	6884	10854	57	115	1.49	-1.48	1.61	17.4	1.0
45	8500	600	10.12	6981	10896	56	110	1.44	-1.43	1.57	17.1	1.0
45	9000	400	13.36	6069	10855	63	193	2.25	-2.23	2.08	22.6	1.2
45	9000	420	13.04	6212	10936	62	182	2.14	-2.12	2.02	22.0	1.1
45	9000	440	12.72	6346	11012	61	172	2.03	-2.01	1.95	21.5	1.1
45	9000	460	12.41	6472	11086	61	163	1.93	-1.91	1.89	21.0	1.1
45	9000	480	12.11	6590	11155	60	154	1.84	-1.83	1.83	20.5	1.0
45	9000	500	11.82	6701	11221	59	146	1.76	-1.75	1.78	20.0	1.0
45	9000	520	11.55	6806	11283	59	139	1.68	-1.67	1.73	19.5	1.0
45	9000	540	11.29	6903	11342	58	132	1.61	-1.60	1.68	19.1	1.0
45	9000	560	11.05	6993	11398	58	125	1.55	-1.54	1.64	18.7	1.0
45	9000	580	10.84	7075	11448	57	120	1.50	-1.49	1.60	18.3	1.1
45	9000	600	10.65	7149	11494	57	115	1.45	-1.44	1.57	18.0	1.2
45	9500	400	13.96	6321	11411	64	199	2.26	-2.24	2.07	23.6	1.2
45	9500	420	13.61	6473	11496	63	188	2.15	-2.13	2.00	23.0	1.2
45	9500	440	13.28	6616	11577	62	178	2.04	-2.02	1.94	22.4	1.2
45	9500	460	12.96	6751	11654	61	168	1.94	-1.92	1.88	21.9	1.1
45	9500	480	12.65	6877	11728	61	159	1.85	-1.83	1.82	21.4	1.1
45	9500	500	12.36	6996	11798	60	151	1.77	-1.75	1.77	20.9	1.1
45	9500	520	12.08	7107	11864	59	144	1.69	-1.68	1.72	20.4	1.1
45	9500	540	11.82	7212	11927	59	137	1.62	-1.61	1.67	20.0	1.1
45	9500	560	11.58	7308	11986	58	130	1.56	-1.55	1.63	19.6	1.1
45	9500	580	11.36	7396	12039	58	124	1.51	-1.50	1.60	19.2	1.2
45	9500	600	11.18	7474	12088	57	119	1.46	-1.45	1.56	18.9	1.3
45	10000	400	14.52	6568	11964	64	205	2.27	-2.25	2.05	24.5	1.3
45	10000	420	14.17	6729	12053	63	194	2.15	-2.13	1.99	24.0	1.3
45	10000	440	13.83	6881	12139	62	183	2.05	-2.03	1.93	23.4	1.3
45	10000	460	13.51	7024	12220	62	174	1.95	-1.93	1.87	22.8	1.2
45	10000	480	13.19	7159	12298	61	165	1.86	-1.84	1.81	22.3	1.2
45	10000	500	12.89	7285	12372	60	156	1.78	-1.76	1.76	21.8	1.2
45	10000	520	12.61	7404	12443	60	149	1.70	-1.69	1.71	21.3	1.2
45	10000	540	12.34	7515	12509	59	141	1.63	-1.62	1.67	20.9	1.2
45	10000	560	12.10	7617	12571	59	135	1.57	-1.56	1.63	20.5	1.2
45	10000	580	11.89	7710	12627	58	129	1.52	-1.51	1.59	20.1	1.3
45	10000	600	11.69	7793	12678	58	124	1.47	-1.46	1.56	19.8	1.4

Figure 6-67 (Sheet 20 of 20)



# **Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	200	400	3.41	2281	2290	10	90	0.23	-0.22	2.52	5.8	0.1
0	200	420	3.41	2395	2403	9	86	0.21	-0.20	2.40	5.8	0.1
0	200	440	3.41	2508	2516	9	92	0.19	-0.18	2.29	5.8	0.1
0	200	460	3.42	2621	2628	8	78	0.18	-0.17	2.20	5.8	0.1
0	200	480	3.42	2734	2741	8	75	0.16	-0.15	2.11	5.8	0.1
0	200	500	3.42	2847	2854	8	72	0.15	-0.14	2.02	5.8	0.1
0	200	520	3.42	2960	2966	8	69	0.14	-0.13	1.95	5.8	0.1
0	200	540	3.42	3072	3079	7	67	0.13	-0.12	1.88	5.8	0.1
0	200	560	3.42	3185	3191	7	64	0.12	-0.11	1.81	5.8	0.1
0	200	580	3.42	3298	3304	7	62	0.11	-0.11	1.75	5.8	0.1
0	200	600	3.42	3410	3416	7	60	0.10	-0.10	1.69	5.8	0.1
0	300	400	4.21	2808	2824	12	109	0.28	-0.27	2.52	7.1	0.1
0	300	420	4.21	2947	2962	11	104	0.25	-0.24	2.40	7.1	0.1
0	300	440	4.21	3086	3101	11	99	0.23	-0.22	2.30	7.1	0.1
0	300	460	4.21	3225	3239	10	95	0.21	-0.20	2.20	7.1	0.1
0	300	480	4.22	3364	3377	10	91	0.20	-0.19	2.11	7.1	0.1
0	300	500	4.22	3503	3515	10	87	0.18	-0.17	2.03	7.1	0.1
0	300	520	4.22	3641	3653	9	84	0.17	-0.16	1.95	7.1	0.1
0	300	540	4.22	3780	3792	9	81	0.15	-0.15	1.88	7.1	0.1
0	300	560	4.22	3918	3929	9	78	0.14	-0.14	1.81	7.1	0.1
0	300	580	4.22	4056	4067	8	75	0.13	-0.13	1.75	7.1	0.1
0	300	600	4.22	4194	4205	8	73	0.13	-0.12	1.70	7.1	0.1
0	400	400	4.89	3251	3275	14	125	0.32	-0.31	2.52	8.3	0.1
0	400	420	4.89	3412	3435	13	119	0.29	-0.28	2.40	8.3	0.1
0	400	440	4.89	3572	3595	12	113	0.27	-0.25	2.30	8.3	0.1
0	400	460	4.89	3733	3754	12	108	0.24	-0.23	2.20	8.3	0.1
0	400	480	4.89	3893	3914	11	104	0.22	-0.21	2.11	8.3	0.2
0	400	500	4.89	4054	4073	11	100	0.21	-0.20	2.03	8.3	0.2
0	400	520	4.89	4214	4233	11	96	0.19	-0.18	1.95	8.3	0.2
0	400	540	4.89	4374	4392	10	93	0.18	-0.17	1.88	8.3	0.2
0	400	560	4.90	4533	4551	10	89	0.17	-0.16	1.82	8.3	0.2
0	400	580	4.90	4693	4710	10	86	0.15	-0.15	1.76	8.3	0.2
0	400	600	4.90	4852	4869	9	83	0.14	-0.14	1.70	8.3	0.2
0	500	400	5.48	3640	3674	15	138	0.36	-0.34	2.52	9.3	0.2
0	500	420	5.48	3820	3852	15	132	0.32	-0.31	2.40	9.3	0.2
0	500	440	5.48	4000	4031	14	126	0.30	-0.28	2.30	9.3	0.2
0	500	460	5.49	4179	4209	13	121	0.27	-0.26	2.20	9.3	0.2
0	500	480	5.49	4358	4387	13	116	0.25	-0.24	2.11	9.3	0.2
0	500	500	5.49	4537	4565	12	111	0.23	-0.22	2.03	9.3	0.2
0	500	520	5.49	4716	4743	12	107	0.21	-0.20	1.96	9.3	0.2
0	500	540	5.49	4895	4921	11	103	0.20	-0.19	1.89	9.3	0.2
0	500	560	5.49	5074	5098	11	99	0.18	-0.18	1.82	9.3	0.2
0	500	580	5.49	5252	5276	11	96	0.17	-0.17	1.76	9.3	0.2
0	500	600	5.50	5430	5453	10	93	0.16	-0.16	1.70	9.3	0.2
0	600	400	6.02	3991	4036	17	151	0.39	-0.37	2.52	10.2	0.2
0	600	420	6.02	4188	4231	16	144	0.35	-0.34	2.40	10.2	0.2
0	600	440	6.02	4385	4426	15	138	0.32	-0.31	2.30	10.2	0.2
0	600	460	6.02	4581	4620	15	132	0.30	-0.28	2.20	10.2	0.2
0	600	480	6.03	4778	4815	14	126	0.27	-0.26	2.11	10.2	0.2
0	600	500	6.03	4974	5010	13	121	0.25	-0.24	2.03	10.2	0.2
0	600	520	6.03	5170	5204	13	117	0.23	-0.22	1.96	10.2	0.2
0	600	540	6.03	5365	5399	13	113	0.22	-0.21	1.89	10.2	0.3
0	600	560	6.03	5561	5593	12	109	0.20	-0.19	1.82	10.2	0.3
0	600	580	6.04	5756	5787	12	105	0.19	-0.18	1.76	10.2	0.3
0	600	600	6.04	5950	5980	11	102	0.18	-0.17	1.71	10.2	0.3
0	700	400	6.51	4313	4370	18	163	0.42	-0.40	2.52	11.0	0.2
0	700	420	6.52	4526	4580	17	155	0.38	-0.36	2.40	11.0	0.2
0	700	440	6.52	4738	4790	16	148	0.35	-0.33	2.30	11.0	0.2
0	700	460	6.52	4951	5000	16	142	0.32	-0.31	2.20	11.0	0.3
0	700	480	6.52	5162	5210	15	136	0.29	-0.28	2.12	11.0	0.3
0	700	500	6.53	5374	5419	15	131	0.27	-0.26	2.03	11.0	0.3
0	700	520	6.53	5585	5629	14	126	0.25	-0.24	1.96	11.0	0.3
0	700	540	6.53	5797	5839	14	121	0.23	-0.22	1.89	11.0	0.3
0	700	560	6.53	6007	6048	13	117	0.22	-0.21	1.83	11.0	0.3
0	700	580	6.53	6218	6257	13	113	0.20	-0.20	1.76	11.0	0.3
0	700	600	6.54	6428	6466	12	109	0.19	-0.18	1.71	11.0	0.3

Figure 6-68 (Sheet 1 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	800	400	6.98	4613	4681	19	173	0.45	-0.42	2.52	11.8	0.3
0	800	420	6.98	4840	4905	18	165	0.41	-0.39	2.40	11.8	0.3
0	800	440	6.98	5067	5130	17	158	0.37	-0.35	2.30	11.8	0.3
0	800	460	6.98	5293	5354	17	151	0.34	-0.33	2.20	11.8	0.3
0	800	480	6.99	5520	5577	16	145	0.31	-0.30	2.12	11.8	0.3
0	800	500	6.99	5746	5801	16	140	0.29	-0.28	2.04	11.8	0.3
0	800	520	6.99	5972	6025	15	134	0.27	-0.26	1.96	11.8	0.3
0	800	540	6.99	6197	6248	14	129	0.25	-0.24	1.89	11.8	0.3
0	800	560	7.00	6422	6472	14	125	0.23	-0.22	1.83	11.8	0.4
0	800	580	7.00	6647	6695	14	121	0.22	-0.21	1.77	11.8	0.4
0	800	600	7.00	6871	6917	13	117	0.20	-0.20	1.71	11.8	0.4
0	900	400	7.41	4893	4975	20	183	0.47	-0.45	2.52	12.5	0.3
0	900	420	7.41	5134	5212	19	175	0.43	-0.41	2.40	12.5	0.3
0	900	440	7.42	5375	5450	19	167	0.39	-0.37	2.30	12.5	0.3
0	900	460	7.42	5615	5687	18	160	0.36	-0.34	2.20	12.5	0.3
0	900	480	7.42	5855	5924	17	154	0.33	-0.32	2.12	12.5	0.3
0	900	500	7.42	6094	6160	16	148	0.31	-0.29	2.04	12.5	0.4
0	900	520	7.43	6333	6397	16	142	0.28	-0.27	1.96	12.6	0.4
0	900	540	7.43	6572	6634	15	137	0.26	-0.25	1.89	12.6	0.4
0	900	560	7.43	6811	6870	15	132	0.25	-0.24	1.83	12.6	0.4
0	900	580	7.44	7049	7106	14	128	0.23	-0.22	1.77	12.6	0.4
0	900	600	7.44	7286	7341	14	124	0.22	-0.21	1.71	12.6	0.4
0	1000	400	7.82	5158	5254	21	193	0.49	-0.47	2.52	13.2	0.3
0	1000	420	7.83	5412	5504	20	184	0.45	-0.43	2.40	13.2	0.3
0	1000	440	7.83	5665	5753	19	176	0.41	-0.39	2.30	13.2	0.4
0	1000	460	7.83	5918	6002	19	169	0.38	-0.36	2.20	13.2	0.4
0	1000	480	7.83	6171	6252	18	162	0.35	-0.33	2.12	13.2	0.4
0	1000	500	7.84	6423	6501	17	156	0.32	-0.31	2.04	13.2	0.4
0	1000	520	7.84	6675	6749	17	150	0.30	-0.29	1.96	13.3	0.4
0	1000	540	7.84	6926	6998	16	144	0.28	-0.27	1.89	13.3	0.4
0	1000	560	7.85	7177	7247	16	139	0.26	-0.25	1.83	13.3	0.4
0	1000	580	7.85	7428	7495	15	135	0.24	-0.23	1.77	13.3	0.5
0	1000	600	7.85	7677	7742	15	130	0.23	-0.22	1.71	13.3	0.5
0	1500	400	9.63	6315	6490	26	235	0.60	-0.57	2.51	16.3	0.5
0	1500	420	9.63	6624	6792	25	224	0.54	-0.52	2.40	16.3	0.5
0	1500	440	9.64	6933	7094	24	214	0.50	-0.48	2.30	16.3	0.5
0	1500	460	9.64	7242	7395	23	205	0.46	-0.44	2.20	16.3	0.5
0	1500	480	9.64	7550	7697	22	197	0.42	-0.41	2.12	16.3	0.6
0	1500	500	9.65	7857	7999	21	190	0.39	-0.38	2.04	16.3	0.6
0	1500	520	9.65	8164	8300	20	183	0.36	-0.35	1.97	16.3	0.6
0	1500	540	9.66	8470	8602	20	176	0.34	-0.33	1.90	16.3	0.6
0	1500	560	9.66	8775	8903	19	170	0.32	-0.31	1.83	16.3	0.7
0	1500	580	9.67	9080	9203	19	165	0.30	-0.29	1.78	16.3	0.7
0	1500	600	9.67	9383	9502	18	159	0.28	-0.27	1.72	16.3	0.7
0	2000	400	11.15	7284	7554	29	269	0.68	-0.65	2.49	18.8	0.6
0	2000	420	11.16	7640	7898	28	257	0.62	-0.59	2.39	18.9	0.7
0	2000	440	11.16	7996	8242	27	246	0.57	-0.55	2.29	18.9	0.7
0	2000	460	11.17	8350	8587	26	236	0.53	-0.50	2.20	18.9	0.7
0	2000	480	11.18	8704	8931	25	227	0.49	-0.47	2.11	18.9	0.8
0	2000	500	11.18	9057	9275	24	218	0.45	-0.43	2.04	18.9	0.8
0	2000	520	11.19	9410	9620	23	210	0.42	-0.40	1.97	18.9	0.8
0	2000	540	11.19	9761	9964	23	203	0.39	-0.38	1.90	18.9	0.8
0	2000	560	11.20	10112	10308	22	196	0.36	-0.35	1.84	18.9	0.9
0	2000	580	11.21	10462	10652	21	190	0.34	-0.33	1.78	18.9	0.9
0	2000	600	11.21	10809	10993	21	184	0.32	-0.31	1.72	18.9	0.9
0	2500	400	12.50	8134	8510	32	299	0.75	-0.72	2.48	21.1	0.8
0	2500	420	12.51	8531	8890	31	286	0.69	-0.66	2.38	21.1	0.8
0	2500	440	12.52	8927	9271	30	274	0.63	-0.60	2.28	21.2	0.9
0	2500	460	12.52	9322	9651	29	263	0.58	-0.56	2.19	21.2	0.9
0	2500	480	12.53	9716	10033	28	253	0.54	-0.52	2.11	21.2	0.9
0	2500	500	12.54	10109	10414	27	243	0.50	-0.48	2.03	21.2	1.0
0	2500	520	12.54	10501	10795	26	235	0.47	-0.45	1.96	21.2	1.0
0	2500	540	12.55	10893	11176	25	226	0.43	-0.42	1.90	21.2	1.0
0	2500	560	12.56	11283	11557	24	219	0.41	-0.39	1.84	21.2	1.1
0	2500	580	12.57	11672	11937	24	212	0.38	-0.37	1.78	21.2	1.1
0	2500	600	12.57	12058	12314	23	205	0.36	-0.35	1.73	21.2	1.2

**Figure 6-68 (Sheet 2 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	200	400	1.40	924	945	14	44	0.60	-0.59	2.50	2.4	0.0
10	200	420	1.35	937	958	14	41	0.56	-0.55	2.38	2.3	0.0
10	200	440	1.30	949	970	13	38	0.53	-0.52	2.27	2.2	0.0
10	200	460	1.26	960	980	13	36	0.49	-0.49	2.17	2.1	0.0
10	200	480	1.22	970	990	13	34	0.47	-0.46	2.08	2.1	0.0
10	200	500	1.18	979	999	13	32	0.44	-0.44	2.00	2.0	0.0
10	200	520	1.15	987	1008	13	30	0.42	-0.42	1.92	1.9	0.0
10	200	540	1.11	995	1015	12	29	0.40	-0.40	1.85	1.9	0.0
10	200	560	1.08	1002	1022	12	27	0.38	-0.38	1.79	1.8	0.0
10	200	580	1.05	1009	1029	12	26	0.36	-0.36	1.73	1.8	0.0
10	200	600	1.02	1015	1035	12	25	0.35	-0.35	1.67	1.7	0.0
10	300	400	1.97	1302	1336	16	56	0.65	-0.64	2.49	3.3	0.0
10	300	420	1.91	1325	1358	15	52	0.60	-0.59	2.38	3.2	0.0
10	300	440	1.85	1346	1379	15	49	0.57	-0.56	2.27	3.1	0.0
10	300	460	1.80	1365	1398	14	46	0.53	-0.52	2.17	3.0	0.0
10	300	480	1.75	1383	1416	14	43	0.50	-0.49	2.08	3.0	0.0
10	300	500	1.70	1400	1432	14	40	0.47	-0.47	2.00	2.9	0.0
10	300	520	1.65	1416	1447	14	38	0.45	-0.44	1.93	2.8	0.0
10	300	540	1.60	1430	1461	13	36	0.43	-0.42	1.85	2.7	0.0
10	300	560	1.56	1443	1474	13	34	0.41	-0.40	1.79	2.6	0.0
10	300	580	1.52	1456	1486	13	32	0.39	-0.38	1.73	2.6	0.0
10	300	600	1.48	1467	1498	13	30	0.37	-0.37	1.67	2.5	0.0
10	400	400	2.49	1645	1693	17	67	0.69	-0.68	2.49	4.2	0.0
10	400	420	2.42	1678	1725	16	63	0.64	-0.63	2.37	4.1	0.0
10	400	440	2.36	1709	1755	16	59	0.60	-0.59	2.27	4.0	0.0
10	400	460	2.29	1738	1783	16	55	0.56	-0.55	2.17	3.9	0.0
10	400	480	2.23	1764	1809	15	51	0.53	-0.52	2.08	3.8	0.0
10	400	500	2.17	1789	1834	15	48	0.50	-0.49	2.00	3.7	0.0
10	400	520	2.12	1813	1856	15	46	0.47	-0.47	1.93	3.6	0.0
10	400	540	2.06	1834	1877	14	43	0.45	-0.44	1.86	3.5	0.0
10	400	560	2.01	1855	1897	14	41	0.43	-0.42	1.79	3.4	0.0
10	400	580	1.96	1874	1916	14	38	0.41	-0.40	1.73	3.3	0.0
10	400	600	1.91	1891	1933	14	37	0.39	-0.38	1.67	3.2	0.0
10	500	400	2.98	1961	2024	18	78	0.73	-0.71	2.49	5.0	0.1
10	500	420	2.90	2005	2066	18	73	0.68	-0.66	2.37	4.9	0.1
10	500	440	2.83	2045	2106	17	68	0.63	-0.62	2.27	4.8	0.1
10	500	460	2.75	2084	2143	17	64	0.59	-0.58	2.17	4.7	0.1
10	500	480	2.68	2119	2178	16	60	0.56	-0.55	2.08	4.5	0.1
10	500	500	2.62	2153	2210	16	56	0.52	-0.52	2.00	4.4	0.1
10	500	520	2.55	2184	2241	16	53	0.50	-0.49	1.93	4.3	0.1
10	500	540	2.49	2214	2270	15	50	0.47	-0.46	1.86	4.2	0.0
10	500	560	2.43	2242	2297	15	47	0.45	-0.44	1.79	4.1	0.0
10	500	580	2.38	2268	2322	15	45	0.42	-0.42	1.73	4.0	0.0
10	500	600	2.32	2292	2346	14	42	0.40	-0.40	1.67	3.9	0.0
10	600	400	3.43	2256	2334	19	88	0.76	-0.74	2.48	5.8	0.1
10	600	420	3.35	2310	2386	19	82	0.71	-0.69	2.37	5.7	0.1
10	600	440	3.27	2360	2435	18	77	0.66	-0.65	2.27	5.5	0.1
10	600	460	3.19	2408	2482	18	72	0.62	-0.61	2.17	5.4	0.1
10	600	480	3.11	2453	2525	17	68	0.58	-0.57	2.08	5.3	0.1
10	600	500	3.04	2495	2566	17	64	0.55	-0.54	2.00	5.1	0.1
10	600	520	2.97	2535	2605	16	60	0.52	-0.51	1.93	5.0	0.1
10	600	540	2.90	2573	2642	16	57	0.49	-0.48	1.86	4.9	0.1
10	600	560	2.84	2608	2676	16	54	0.46	-0.46	1.79	4.8	0.1
10	600	580	2.77	2641	2708	15	51	0.44	-0.43	1.73	4.7	0.1
10	600	600	2.71	2672	2739	15	48	0.42	-0.41	1.67	4.6	0.1
10	700	400	3.86	2532	2627	20	99	0.79	-0.77	2.48	6.5	0.1
10	700	420	3.77	2597	2689	20	91	0.73	-0.72	2.37	6.4	0.1
10	700	440	3.68	2657	2748	19	85	0.68	-0.67	2.26	6.2	0.1
10	700	460	3.60	2714	2803	19	80	0.64	-0.63	2.17	6.1	0.1
10	700	480	3.52	2768	2856	18	75	0.60	-0.59	2.08	5.9	0.1
10	700	500	3.44	2819	2905	18	71	0.57	-0.56	2.00	5.8	0.1
10	700	520	3.36	2868	2952	17	67	0.53	-0.53	1.93	5.7	0.1
10	700	540	3.29	2913	2996	17	63	0.51	-0.50	1.86	5.6	0.1
10	700	560	3.22	2956	3038	16	60	0.48	-0.47	1.79	5.4	0.1
10	700	580	3.15	2997	3078	16	57	0.46	-0.45	1.73	5.3	0.1
10	700	600	3.09	3035	3115	16	54	0.43	-0.43	1.67	5.2	0.1

Figure 6-68 (Sheet 3 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	800	400	4.26	2754	2907	21	107	0.82	-0.80	2.48	7.2	0.1
10	800	420	4.17	2869	2978	21	100	0.76	-0.74	2.36	7.0	0.1
10	800	440	4.08	2939	3046	20	93	0.71	-0.69	2.26	6.9	0.1
10	800	460	3.99	3005	3110	19	88	0.66	-0.65	2.17	6.7	0.1
10	800	480	3.90	3068	3171	19	82	0.62	-0.61	2.08	6.6	0.1
10	800	500	3.82	3128	3229	18	78	0.58	-0.57	2.00	6.5	0.1
10	800	520	3.74	3185	3284	18	73	0.55	-0.54	1.93	6.3	0.1
10	800	540	3.66	3238	3336	17	69	0.52	-0.51	1.86	6.2	0.1
10	800	560	3.59	3289	3385	17	66	0.49	-0.49	1.79	6.1	0.1
10	800	580	3.52	3337	3432	17	62	0.47	-0.46	1.73	5.9	0.1
10	800	600	3.45	3383	3476	16	59	0.45	-0.44	1.68	5.8	0.1
10	900	400	4.65	3044	3174	22	115	0.84	-0.82	2.47	7.9	0.1
10	900	420	4.55	3128	3254	22	108	0.78	-0.76	2.36	7.7	0.1
10	900	440	4.46	3207	3331	21	101	0.73	-0.71	2.26	7.5	0.1
10	900	460	4.36	3283	3404	20	95	0.68	-0.67	2.17	7.4	0.1
10	900	480	4.27	3355	3474	20	89	0.64	-0.63	2.08	7.2	0.1
10	900	500	4.19	3423	3540	19	84	0.60	-0.59	2.00	7.1	0.1
10	900	520	4.10	3488	3602	19	80	0.57	-0.56	1.93	6.9	0.1
10	900	540	4.02	3550	3662	18	75	0.54	-0.53	1.86	6.8	0.1
10	900	560	3.94	3608	3719	18	71	0.51	-0.50	1.79	6.7	0.1
10	900	580	3.87	3664	3773	17	68	0.48	-0.48	1.73	6.5	0.1
10	900	600	3.79	3717	3825	17	64	0.46	-0.45	1.68	6.4	0.1
10	1000	400	5.02	3282	3431	23	123	0.87	-0.84	2.47	8.5	0.1
10	1000	420	4.92	3375	3520	22	115	0.80	-0.79	2.36	8.3	0.1
10	1000	440	4.82	3464	3606	22	108	0.75	-0.73	2.26	8.1	0.1
10	1000	460	4.72	3549	3687	21	102	0.70	-0.69	2.16	8.0	0.1
10	1000	480	4.63	3630	3765	20	96	0.66	-0.64	2.08	7.8	0.1
10	1000	500	4.54	3706	3839	20	91	0.62	-0.61	2.00	7.7	0.1
10	1000	520	4.45	3779	3910	19	86	0.58	-0.57	1.92	7.5	0.1
10	1000	540	4.37	3849	3977	19	81	0.55	-0.54	1.86	7.4	0.1
10	1000	560	4.29	3916	4041	18	77	0.52	-0.51	1.79	7.2	0.1
10	1000	580	4.21	3979	4103	18	73	0.50	-0.49	1.73	7.1	0.1
10	1000	600	4.13	4039	4161	18	70	0.47	-0.47	1.68	7.0	0.1
10	1500	400	6.67	4344	4595	27	160	0.97	-0.94	2.45	11.3	0.3
10	1500	420	6.56	4482	4726	26	150	0.90	-0.87	2.35	11.1	0.3
10	1500	440	6.45	4614	4852	25	141	0.84	-0.82	2.25	10.9	0.3
10	1500	460	6.35	4741	4973	24	133	0.78	-0.76	2.16	10.7	0.3
10	1500	480	6.24	4864	5090	24	126	0.73	-0.72	2.07	10.5	0.3
10	1500	500	6.14	4981	5202	23	119	0.69	-0.67	1.99	10.4	0.3
10	1500	520	6.04	5093	5310	22	113	0.65	-0.64	1.92	10.2	0.3
10	1500	540	5.94	5202	5414	22	107	0.61	-0.60	1.85	10.0	0.3
10	1500	560	5.85	5305	5513	21	102	0.58	-0.57	1.79	9.9	0.3
10	1500	580	5.75	5405	5610	21	97	0.55	-0.54	1.73	9.7	0.3
10	1500	600	5.66	5500	5701	20	93	0.52	-0.52	1.68	9.6	0.3
10	2000	400	8.11	5255	5623	30	191	1.05	-1.02	2.44	13.7	0.4
10	2000	420	7.99	5433	5790	29	180	0.97	-0.95	2.33	13.5	0.4
10	2000	440	7.87	5605	5951	28	170	0.91	-0.88	2.24	13.3	0.4
10	2000	460	7.76	5771	6107	27	160	0.85	-0.83	2.15	13.1	0.4
10	2000	480	7.65	5930	6259	27	152	0.79	-0.78	2.06	12.9	0.4
10	2000	500	7.54	6085	6405	26	144	0.75	-0.73	1.99	12.7	0.4
10	2000	520	7.43	6234	6547	25	137	0.70	-0.69	1.92	12.6	0.4
10	2000	540	7.32	6378	6684	24	130	0.66	-0.65	1.85	12.4	0.4
10	2000	560	7.22	6517	6817	24	124	0.63	-0.62	1.79	12.2	0.4
10	2000	580	7.12	6651	6945	23	119	0.60	-0.59	1.73	12.0	0.4
10	2000	600	7.02	6779	7068	23	113	0.57	-0.56	1.68	11.9	0.4
10	2500	400	9.40	6065	6560	33	213	1.11	-1.08	2.42	15.9	0.5
10	2500	420	9.27	6279	6759	32	206	1.03	-1.01	2.32	15.7	0.5
10	2500	440	9.15	6487	6952	31	194	0.96	-0.94	2.22	15.5	0.5
10	2500	460	9.03	6688	7140	30	184	0.90	-0.88	2.14	15.3	0.5
10	2500	480	8.91	6882	7322	29	175	0.85	-0.83	2.06	15.1	0.5
10	2500	500	8.80	7071	7500	28	166	0.80	-0.78	1.98	14.9	0.5
10	2500	520	8.69	7254	7672	27	158	0.75	-0.73	1.91	14.7	0.5
10	2500	540	8.57	7431	7840	27	151	0.71	-0.69	1.85	14.5	0.5
10	2500	560	8.46	7602	8003	26	144	0.67	-0.66	1.79	14.3	0.5
10	2500	580	8.36	7769	8161	25	138	0.64	-0.62	1.73	14.1	0.5
10	2500	600	8.26	7927	8312	25	132	0.60	-0.59	1.68	14.0	0.5

Figure 6-68 (Sheet 4 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	3000	400	10.57	6801	7433	35	242	1.17	-1.14	2.40	17.9	0.6
10	3000	420	10.44	7048	7660	34	229	1.09	-1.06	2.30	17.6	0.6
10	3000	440	10.32	7289	7882	33	217	1.01	-0.99	2.21	17.4	0.6
10	3000	460	10.20	7522	8098	32	206	0.95	-0.93	2.13	17.2	0.6
10	3000	480	10.08	7749	8309	31	196	0.89	-0.87	2.05	17.0	0.6
10	3000	500	9.96	7969	8515	30	186	0.84	-0.82	1.98	16.8	0.6
10	3000	520	9.84	8183	8716	29	178	0.79	-0.77	1.91	16.6	0.6
10	3000	540	9.72	8391	8912	29	170	0.75	-0.73	1.84	16.4	0.7
10	3000	560	9.61	8593	9102	28	162	0.71	-0.69	1.78	16.2	0.7
10	3000	580	9.50	8790	9288	27	155	0.67	-0.66	1.73	16.1	0.7
10	3000	600	9.39	8977	9465	26	149	0.64	-0.63	1.68	15.9	0.7
10	3500	400	11.66	7479	8257	38	264	1.22	-1.18	2.39	19.7	0.7
10	3500	420	11.53	7757	8510	36	250	1.13	-1.10	2.29	19.5	0.7
10	3500	440	11.40	8028	8758	35	238	1.06	-1.03	2.20	19.3	0.7
10	3500	460	11.28	8292	9001	34	226	0.99	-0.97	2.12	19.1	0.8
10	3500	480	11.15	8549	9238	33	215	0.93	-0.91	2.04	18.9	0.8
10	3500	500	11.03	8799	9470	32	205	0.88	-0.85	1.97	18.6	0.8
10	3500	520	10.91	9043	9696	31	196	0.83	-0.81	1.90	18.4	0.8
10	3500	540	10.80	9280	9918	30	187	0.78	-0.76	1.84	18.2	0.8
10	3500	560	10.68	9510	10134	30	179	0.74	-0.72	1.78	18.0	0.8
10	3500	580	10.56	9735	10345	29	171	0.70	-0.69	1.73	17.9	0.8
10	3500	600	10.46	9949	10546	28	164	0.67	-0.65	1.68	17.7	0.8
10	4000	400	12.68	8111	9044	39	295	1.26	-1.23	2.37	21.4	0.9
10	4000	420	12.55	8418	9320	38	270	1.18	-1.14	2.28	21.2	0.9
10	4000	440	12.42	8718	9592	37	257	1.10	-1.07	2.19	21.0	0.9
10	4000	460	12.29	9011	9859	36	244	1.03	-1.00	2.11	20.8	0.9
10	4000	480	12.17	9296	10120	35	233	0.97	-0.94	2.03	20.6	0.9
10	4000	500	12.04	9574	10376	34	222	0.91	-0.89	1.96	20.4	0.9
10	4000	520	11.92	9845	10627	33	212	0.86	-0.84	1.90	20.1	0.9
10	4000	540	11.80	10109	10872	32	203	0.81	-0.79	1.83	19.9	0.9
10	4000	560	11.68	10367	11112	31	194	0.77	-0.75	1.78	19.7	0.9
10	4000	580	11.57	10619	11347	30	186	0.73	-0.71	1.72	19.5	1.0
10	4000	600	11.46	10857	11570	30	179	0.69	-0.68	1.67	19.4	1.0
10	4500	400	13.64	8705	9799	41	304	1.30	-1.26	2.35	23.1	1.0
10	4500	420	13.51	9040	10098	40	288	1.21	-1.18	2.26	22.8	1.0
10	4500	440	13.38	9367	10392	39	274	1.13	-1.10	2.18	22.6	1.0
10	4500	460	13.25	9686	10680	37	261	1.06	-1.03	2.10	22.4	1.0
10	4500	480	13.13	9998	10964	36	249	1.00	-0.97	2.02	22.2	1.0
10	4500	500	13.00	10303	11242	35	238	0.94	-0.92	1.95	22.0	1.0
10	4500	520	12.88	10600	11516	34	228	0.89	-0.87	1.89	21.8	1.1
10	4500	540	12.76	10890	11783	34	218	0.84	-0.82	1.83	21.6	1.1
10	4500	560	12.63	11174	12046	33	209	0.79	-0.78	1.77	21.4	1.1
10	4500	580	12.52	11451	12303	32	201	0.75	-0.74	1.72	21.2	1.1
10	4500	600	12.41	11712	12547	31	193	0.72	-0.70	1.67	21.0	1.2
10	5000	400	14.56	9266	10529	43	321	1.34	-1.30	2.34	24.6	1.1
10	5000	420	14.43	9627	10848	41	305	1.25	-1.21	2.25	24.4	1.1
10	5000	440	14.30	9980	11163	40	291	1.17	-1.13	2.16	24.2	1.1
10	5000	460	14.17	10325	11472	39	277	1.09	-1.06	2.09	23.9	1.1
10	5000	480	14.04	10663	11777	38	265	1.03	-1.00	2.01	23.7	1.2
10	5000	500	13.91	10992	12076	37	253	0.97	-0.94	1.95	23.5	1.2
10	5000	520	13.79	11315	12370	36	242	0.91	-0.89	1.88	23.3	1.2
10	5000	540	13.66	11630	12659	35	232	0.86	-0.84	1.82	23.1	1.2
10	5000	560	13.54	11938	12943	34	223	0.82	-0.80	1.77	22.9	1.2
10	5000	580	13.42	12239	13221	33	214	0.78	-0.76	1.72	22.7	1.3
10	5000	600	13.32	12522	13483	32	206	0.74	-0.73	1.67	22.5	1.3
10	5500	400	15.43	9800	11238	44	338	1.37	-1.33	2.32	26.1	1.2
10	5500	420	15.30	10186	11576	43	321	1.28	-1.24	2.23	25.9	1.2
10	5500	440	15.17	10564	11910	41	306	1.19	-1.16	2.15	25.6	1.3
10	5500	460	15.04	10934	12239	40	292	1.12	-1.09	2.08	25.4	1.3
10	5500	480	14.91	11295	12563	39	279	1.05	-1.03	2.01	25.2	1.3
10	5500	500	14.78	11649	12882	38	267	0.99	-0.97	1.94	25.0	1.3
10	5500	520	14.66	11995	13196	37	256	0.94	-0.92	1.88	24.8	1.3
10	5500	540	14.53	12334	13505	36	246	0.89	-0.87	1.82	24.6	1.4
10	5500	560	14.41	12666	13808	35	236	0.84	-0.82	1.76	24.3	1.4
10	5500	580	14.29	12990	14106	34	227	0.80	-0.78	1.71	24.1	1.4
10	5500	600	14.18	13292	14385	34	218	0.76	-0.75	1.67	24.0	1.5

Figure 6-68 (Sheet 5 of 20)

## **Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	200	400	1.03	667	696	18	37	0.78	-0.77	2.49	1.7	0.0
15	200	420	0.99	673	702	18	34	0.73	-0.72	2.37	1.7	0.0
15	200	440	0.95	678	706	18	32	0.69	-0.68	2.27	1.6	0.0
15	200	460	0.91	682	711	17	30	0.65	-0.65	2.17	1.5	0.0
15	200	480	0.88	686	715	17	29	0.62	-0.62	2.08	1.5	0.0
15	200	500	0.85	690	718	17	27	0.59	-0.59	2.00	1.4	0.0
15	200	520	0.82	693	721	17	26	0.56	-0.56	1.92	1.4	0.0
15	200	540	0.79	696	724	17	25	0.54	-0.54	1.85	1.3	0.0
15	200	560	0.77	699	727	17	24	0.52	-0.51	1.79	1.3	0.0
15	200	580	0.74	702	729	17	23	0.50	-0.49	1.72	1.3	0.0
15	200	600	0.72	704	732	17	22	0.48	-0.47	1.67	1.2	0.0
15	300	400	1.49	964	1009	19	45	0.82	-0.81	2.49	2.5	0.0
15	300	420	1.43	974	1020	19	42	0.77	-0.76	2.37	2.4	0.0
15	300	440	1.38	984	1029	19	39	0.72	-0.72	2.27	2.3	0.0
15	300	460	1.33	993	1037	18	37	0.68	-0.68	2.17	2.2	0.0
15	300	480	1.29	1000	1044	18	34	0.65	-0.64	2.08	2.2	0.0
15	300	500	1.24	1008	1051	18	32	0.62	-0.61	2.00	2.1	0.0
15	300	520	1.20	1014	1057	18	31	0.59	-0.58	1.92	2.0	0.0
15	300	540	1.17	1020	1063	18	29	0.56	-0.56	1.85	2.0	0.0
15	300	560	1.13	1025	1068	17	27	0.54	-0.53	1.79	1.9	0.0
15	300	580	1.10	1031	1073	17	26	0.51	-0.51	1.72	1.9	0.0
15	300	600	1.06	1035	1078	17	25	0.49	-0.49	1.67	1.8	0.0
15	400	400	1.92	1242	1305	20	54	0.86	-0.85	2.48	3.2	0.0
15	400	420	1.85	1259	1321	20	50	0.80	-0.79	2.37	3.1	0.0
15	400	440	1.79	1273	1335	20	47	0.76	-0.75	2.26	3.0	0.0
15	400	460	1.73	1287	1348	19	43	0.71	-0.70	2.17	2.9	0.0
15	400	480	1.67	1299	1359	19	41	0.67	-0.67	2.08	2.8	0.0
15	400	500	1.62	1310	1370	19	38	0.64	-0.63	2.00	2.7	0.0
15	400	520	1.57	1321	1380	18	36	0.61	-0.60	1.92	2.7	0.0
15	400	540	1.52	1330	1389	18	34	0.58	-0.57	1.85	2.6	0.0
15	400	560	1.48	1339	1398	18	32	0.55	-0.55	1.79	2.5	0.0
15	400	580	1.43	1347	1405	18	30	0.53	-0.53	1.72	2.4	0.0
15	400	600	1.39	1355	1412	18	29	0.51	-0.50	1.67	2.4	0.0
15	500	400	2.33	1505	1586	21	62	0.89	-0.88	2.48	3.9	0.0
15	500	420	2.25	1528	1608	21	58	0.83	-0.82	2.37	3.8	0.0
15	500	440	2.18	1548	1627	20	54	0.78	-0.77	2.26	3.7	0.0
15	500	460	2.11	1567	1645	20	50	0.74	-0.73	2.16	3.6	0.0
15	500	480	2.04	1585	1662	20	47	0.70	-0.69	2.08	3.5	0.0
15	500	500	1.98	1600	1677	19	44	0.66	-0.65	2.00	3.3	0.0
15	500	520	1.92	1615	1691	19	42	0.63	-0.62	1.92	3.2	0.0
15	500	540	1.87	1629	1704	19	39	0.60	-0.59	1.85	3.2	0.0
15	500	560	1.81	1641	1716	19	37	0.57	-0.56	1.79	3.1	0.0
15	500	580	1.76	1653	1727	18	35	0.54	-0.54	1.72	3.0	0.0
15	500	600	1.72	1663	1737	18	33	0.52	-0.52	1.67	2.9	0.0
15	600	400	2.72	1755	1855	22	71	0.92	-0.91	2.48	4.6	0.0
15	600	420	2.63	1784	1882	22	66	0.86	-0.85	2.36	4.4	0.0
15	600	440	2.55	1811	1908	21	61	0.81	-0.80	2.26	4.3	0.0
15	600	460	2.47	1835	1931	21	57	0.76	-0.75	2.16	4.2	0.0
15	600	480	2.40	1858	1953	20	53	0.72	-0.71	2.08	4.1	0.0
15	600	500	2.33	1879	1972	20	50	0.68	-0.67	1.99	3.9	0.0
15	600	520	2.26	1898	1991	20	47	0.65	-0.64	1.92	3.8	0.0
15	600	540	2.20	1916	2008	19	44	0.61	-0.61	1.85	3.7	0.0
15	600	560	2.14	1933	2024	19	42	0.59	-0.58	1.79	3.6	0.0
15	600	580	2.08	1948	2038	19	40	0.56	-0.55	1.72	3.5	0.0
15	600	600	2.03	1962	2052	19	37	0.54	-0.53	1.67	3.4	0.0
15	700	400	3.09	1994	2113	23	79	0.95	-0.94	2.47	5.2	0.1
15	700	420	3.00	2029	2147	23	73	0.89	-0.87	2.36	5.1	0.1
15	700	440	2.91	2062	2178	22	68	0.83	-0.82	2.26	4.9	0.1
15	700	460	2.82	2093	2207	22	64	0.78	-0.77	2.16	4.8	0.1
15	700	480	2.74	2121	2234	21	59	0.74	-0.73	2.07	4.6	0.1
15	700	500	2.66	2147	2258	21	56	0.70	-0.69	1.99	4.5	0.1
15	700	520	2.59	2171	2281	20	52	0.66	-0.66	1.92	4.4	0.1
15	700	540	2.52	2194	2303	20	49	0.63	-0.62	1.85	4.3	0.1
15	700	560	2.45	2215	2323	20	47	0.60	-0.59	1.78	4.1	0.1
15	700	580	2.39	2234	2341	20	44	0.57	-0.57	1.72	4.0	0.1
15	700	600	2.33	2252	2359	19	42	0.55	-0.54	1.67	3.9	0.0

**Figure 6-68 (Sheet 6 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
deg	ft	kn	sec	ft	ft	deg	mil	HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
									mil/kn		ft/kn	ft/kn
15	800	400	3.45	2222	2362	24	86	0.98	-0.96	2.47	5.8	0.1
15	800	420	3.35	2265	2402	23	80	0.91	-0.90	2.36	5.7	0.1
15	800	440	3.25	2304	2439	23	75	0.86	-0.84	2.25	5.5	0.1
15	800	460	3.16	2341	2474	22	70	0.80	-0.79	2.16	5.3	0.1
15	800	480	3.07	2375	2506	22	65	0.76	-0.75	2.07	5.2	0.1
15	800	500	2.99	2406	2536	21	61	0.72	-0.71	1.99	5.1	0.1
15	800	520	2.91	2436	2564	21	58	0.68	-0.67	1.92	4.9	0.1
15	800	540	2.83	2463	2589	21	54	0.65	-0.64	1.85	4.8	0.1
15	800	560	2.76	2488	2614	20	51	0.61	-0.61	1.78	4.7	0.1
15	800	580	2.69	2512	2636	20	49	0.59	-0.58	1.72	4.5	0.1
15	800	600	2.62	2534	2657	20	46	0.56	-0.55	1.67	4.4	0.1
15	900	400	3.79	2442	2602	25	94	1.00	-0.98	2.46	6.4	0.1
15	900	420	3.69	2491	2649	24	87	0.94	-0.92	2.35	6.2	0.1
15	900	440	3.58	2537	2692	24	81	0.88	-0.86	2.25	6.1	0.1
15	900	460	3.49	2580	2732	23	76	0.82	-0.81	2.16	5.9	0.1
15	900	480	3.39	2620	2770	23	71	0.78	-0.76	2.07	5.7	0.1
15	900	500	3.30	2657	2805	22	67	0.73	-0.72	1.99	5.6	0.1
15	900	520	3.22	2691	2838	22	63	0.69	-0.69	1.92	5.4	0.1
15	900	540	3.14	2724	2868	21	59	0.66	-0.65	1.85	5.3	0.1
15	900	560	3.06	2754	2897	21	56	0.63	-0.62	1.78	5.2	0.1
15	900	580	2.98	2782	2924	21	53	0.60	-0.59	1.72	5.0	0.1
15	900	600	2.91	2808	2949	20	50	0.57	-0.57	1.67	4.9	0.1
15	1000	400	4.13	2653	2835	26	101	1.03	-1.01	2.46	7.0	0.1
15	1000	420	4.01	2710	2888	25	94	0.96	-0.94	2.35	6.8	0.1
15	1000	440	3.91	2762	2938	24	88	0.90	-0.88	2.25	6.6	0.1
15	1000	460	3.80	2811	2984	24	82	0.84	-0.83	2.15	6.4	0.1
15	1000	480	3.71	2857	3027	23	77	0.79	-0.78	2.07	6.3	0.1
15	1000	500	3.61	2900	3067	23	72	0.75	-0.74	1.99	6.1	0.1
15	1000	520	3.52	2940	3105	22	68	0.71	-0.70	1.92	5.9	0.1
15	1000	540	3.43	2977	3141	22	64	0.67	-0.66	1.85	5.8	0.1
15	1000	560	3.35	3012	3174	21	61	0.64	-0.63	1.78	5.7	0.1
15	1000	580	3.27	3045	3205	21	57	0.61	-0.60	1.72	5.5	0.1
15	1000	600	3.19	3075	3234	21	54	0.58	-0.58	1.67	5.4	0.1
15	1500	400	5.65	3615	3914	29	133	1.13	-1.10	2.44	9.5	0.2
15	1500	420	5.52	3706	3998	28	125	1.05	-1.03	2.33	9.3	0.2
15	1500	440	5.39	3791	4077	27	117	0.98	-0.96	2.23	9.1	0.2
15	1500	460	5.27	3872	4152	27	109	0.92	-0.90	2.14	8.9	0.2
15	1500	480	5.15	3947	4223	26	103	0.87	-0.85	2.06	8.7	0.2
15	1500	500	5.03	4019	4290	25	97	0.82	-0.80	1.98	8.5	0.2
15	1500	520	4.92	4087	4353	25	91	0.77	-0.76	1.91	8.3	0.2
15	1500	540	4.81	4150	4413	24	86	0.73	-0.72	1.84	8.1	0.2
15	1500	560	4.71	4211	4470	24	82	0.70	-0.69	1.78	8.0	0.2
15	1500	580	4.61	4267	4523	23	78	0.66	-0.65	1.72	7.8	0.2
15	1500	600	4.51	4321	4574	23	74	0.63	-0.62	1.67	7.6	0.2
15	2000	400	7.00	4459	4887	32	161	1.20	-1.18	2.42	11.8	0.3
15	2000	420	6.85	4582	4999	31	151	1.12	-1.10	2.32	11.6	0.3
15	2000	440	6.71	4699	5107	30	142	1.05	-1.03	2.22	11.3	0.3
15	2000	460	6.57	4810	5209	29	134	0.98	-0.97	2.13	11.1	0.3
15	2000	480	6.44	4915	5306	29	126	0.93	-0.91	2.05	10.9	0.3
15	2000	500	6.31	5015	5399	28	119	0.87	-0.86	1.97	10.7	0.3
15	2000	520	6.18	5110	5488	27	112	0.83	-0.81	1.90	10.4	0.3
15	2000	540	6.06	5201	5572	27	106	0.78	-0.77	1.84	10.2	0.3
15	2000	560	5.94	5287	5652	26	101	0.74	-0.73	1.78	10.0	0.3
15	2000	580	5.83	5368	5729	25	96	0.71	-0.70	1.72	9.9	0.3
15	2000	600	5.72	5445	5801	25	91	0.67	-0.66	1.67	9.7	0.3
15	2500	400	8.22	5218	5786	35	186	1.27	-1.24	2.40	13.9	0.4
15	2500	420	8.06	5372	5925	34	175	1.18	-1.16	2.30	13.6	0.4
15	2500	440	7.91	5519	6058	33	165	1.11	-1.08	2.21	13.4	0.4
15	2500	460	7.76	5659	6186	32	155	1.04	-1.02	2.12	13.1	0.4
15	2500	480	7.62	5793	6309	31	147	0.98	-0.96	2.04	12.9	0.4
15	2500	500	7.48	5920	6426	30	139	0.92	-0.90	1.97	12.6	0.4
15	2500	520	7.34	6042	6539	29	132	0.87	-0.86	1.90	12.4	0.4
15	2500	540	7.21	6159	6647	29	125	0.83	-0.81	1.83	12.2	0.4
15	2500	560	7.08	6270	6750	28	119	0.78	-0.77	1.77	12.0	0.4
15	2500	580	6.96	6376	6849	27	113	0.74	-0.73	1.72	11.8	0.4
15	2500	600	6.84	6476	6942	27	108	0.71	-0.70	1.66	11.6	0.4

Figure 6-68 (Sheet 7 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	3000	400	9.34	5913	6631	37	209	1.32	-1.29	2.38	15.8	0.5
15	3000	420	9.18	6096	6794	36	197	1.24	-1.21	2.28	15.5	0.5
15	3000	440	9.02	6271	6952	35	186	1.16	-1.13	2.19	15.2	0.5
15	3000	460	8.87	6439	7104	34	175	1.09	-1.06	2.11	15.0	0.5
15	3000	480	8.71	6600	7250	33	166	1.02	-1.00	2.03	14.7	0.5
15	3000	500	8.57	6755	7391	32	157	0.96	-0.94	1.96	14.5	0.5
15	3000	520	8.42	6903	7526	31	149	0.91	-0.89	1.89	14.2	0.5
15	3000	540	8.28	7044	7657	30	142	0.86	-0.85	1.83	14.0	0.5
15	3000	560	8.14	7180	7782	30	135	0.82	-0.81	1.77	13.8	0.5
15	3000	580	8.01	7311	7902	29	128	0.78	-0.77	1.71	13.5	0.5
15	3000	600	7.89	7433	8016	28	123	0.74	-0.73	1.66	13.3	0.5
15	3500	400	10.39	6558	7433	39	230	1.37	-1.34	2.36	17.6	0.6
15	3500	420	10.22	6768	7620	38	217	1.28	-1.25	2.27	17.3	0.6
15	3500	440	10.06	6971	7800	37	205	1.20	-1.17	2.18	17.0	0.6
15	3500	460	9.90	7165	7974	36	194	1.13	-1.10	2.10	16.7	0.6
15	3500	480	9.74	7352	8143	35	183	1.06	-1.04	2.02	16.5	0.6
15	3500	500	9.59	7532	8306	34	174	1.00	-0.98	1.95	16.2	0.6
15	3500	520	9.43	7705	8463	33	165	0.95	-0.93	1.88	15.9	0.6
15	3500	540	9.29	7871	8614	32	157	0.90	-0.88	1.82	15.7	0.6
15	3500	560	9.14	8031	8761	31	150	0.85	-0.84	1.76	15.5	0.6
15	3500	580	9.00	8185	8902	31	143	0.81	-0.80	1.71	15.2	0.6
15	3500	600	8.87	8329	9034	30	137	0.77	-0.76	1.66	15.0	0.6
15	4000	400	11.38	7161	8203	41	249	1.41	-1.38	2.34	19.2	0.7
15	4000	420	11.21	7398	8410	39	235	1.32	-1.29	2.25	18.9	0.7
15	4000	440	11.04	7626	8612	38	222	1.24	-1.21	2.17	18.7	0.7
15	4000	460	10.87	7846	8807	37	211	1.16	-1.14	2.09	18.4	0.7
15	4000	480	10.71	8058	8996	36	200	1.09	-1.07	2.01	18.1	0.7
15	4000	500	10.55	8263	9180	35	190	1.03	-1.01	1.94	17.8	0.7
15	4000	520	10.39	8459	9357	34	181	0.98	-0.96	1.88	17.6	0.7
15	4000	540	10.24	8649	9529	34	172	0.93	-0.91	1.82	17.3	0.7
15	4000	560	10.09	8832	9696	33	164	0.88	-0.86	1.76	17.1	0.7
15	4000	580	9.94	9008	9856	32	157	0.84	-0.82	1.71	16.8	0.7
15	4000	600	9.81	9173	10007	31	150	0.80	-0.79	1.66	16.6	0.8
15	4500	400	12.32	7730	8945	42	266	1.45	-1.41	2.33	20.8	0.8
15	4500	420	12.14	7992	9172	41	252	1.36	-1.32	2.24	20.5	0.8
15	4500	440	11.97	8245	9393	40	239	1.27	-1.24	2.15	20.2	0.8
15	4500	460	11.80	8490	9608	39	227	1.19	-1.17	2.07	19.9	0.8
15	4500	480	11.63	8725	9817	38	215	1.13	-1.10	2.00	19.7	0.8
15	4500	500	11.47	8953	10020	37	205	1.06	-1.04	1.93	19.4	0.8
15	4500	520	11.31	9173	10217	36	195	1.01	-0.99	1.87	19.1	0.8
15	4500	540	11.15	9386	10409	35	186	0.95	-0.94	1.81	18.8	0.8
15	4500	560	10.99	9591	10594	34	178	0.91	-0.89	1.75	18.6	0.8
15	4500	580	10.84	9789	10774	33	170	0.86	-0.85	1.70	18.3	0.9
15	4500	600	10.71	9973	10941	33	163	0.82	-0.81	1.65	18.1	0.9
15	5000	400	13.21	8270	9664	44	283	1.48	-1.45	2.31	22.3	0.9
15	5000	420	13.03	8556	9910	42	263	1.39	-1.36	2.22	22.0	0.9
15	5000	440	12.85	8833	10150	41	254	1.30	-1.27	2.14	21.7	0.9
15	5000	460	12.68	9100	10383	40	241	1.22	-1.20	2.06	21.4	0.9
15	5000	480	12.51	9359	10611	39	230	1.15	-1.13	1.99	21.1	1.0
15	5000	500	12.34	9610	10833	38	219	1.09	-1.07	1.93	20.9	1.0
15	5000	520	12.18	9852	11048	37	209	1.03	-1.01	1.86	20.6	1.0
15	5000	540	12.02	10086	11258	36	199	0.98	-0.96	1.80	20.3	1.0
15	5000	560	11.86	10313	11461	35	190	0.93	-0.91	1.75	20.0	1.0
15	5000	580	11.71	10532	11659	35	182	0.89	-0.87	1.70	19.8	1.0
15	5000	600	11.57	10735	11842	34	175	0.85	-0.83	1.65	19.6	1.0
15	5500	400	14.06	8785	10364	45	299	1.51	-1.48	2.29	23.8	1.0
15	5500	420	13.88	9094	10628	44	283	1.42	-1.38	2.21	23.5	1.0
15	5500	440	13.70	9393	10885	43	269	1.33	-1.30	2.13	23.2	1.1
15	5500	460	13.53	9683	11136	41	256	1.25	-1.22	2.05	22.9	1.1
15	5500	480	13.35	9964	11381	40	243	1.18	-1.16	1.98	22.6	1.1
15	5500	500	13.18	10236	11620	39	232	1.12	-1.09	1.92	22.3	1.1
15	5500	520	13.01	10500	11853	38	221	1.06	-1.04	1.86	22.0	1.1
15	5500	540	12.85	10756	12080	37	212	1.00	-0.98	1.80	21.7	1.1
15	5500	560	12.69	11003	12301	37	202	0.95	-0.93	1.74	21.4	1.1
15	5500	580	12.53	11243	12516	36	194	0.91	-0.89	1.69	21.2	1.1
15	5500	600	12.40	11463	12715	35	186	0.87	-0.85	1.65	21.0	1.2

Figure 6-68 (Sheet 8 of 20)



# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	1500	400	4.86	3030	3381	32	113	1.27	-1.25	2.43	8.2	0.1
20	1500	420	4.72	3090	3435	31	105	1.19	-1.17	2.32	8.0	0.1
20	1500	440	4.59	3146	3485	30	99	1.12	-1.10	2.22	7.8	0.1
20	1500	460	4.46	3198	3532	30	91	1.05	-1.04	2.13	7.5	0.1
20	1500	480	4.34	3246	3576	29	86	0.99	-0.98	2.05	7.3	0.1
20	1500	500	4.22	3291	3616	29	80	0.94	-0.93	1.97	7.1	0.1
20	1500	520	4.11	3332	3654	28	75	0.89	-0.88	1.90	7.0	0.1
20	1500	540	4.01	3371	3690	28	71	0.85	-0.84	1.84	6.8	0.1
20	1500	560	3.91	3408	3723	27	67	0.81	-0.80	1.77	6.6	0.1
20	1500	580	3.81	3442	3754	27	63	0.77	-0.76	1.71	6.4	0.1
20	1500	600	3.72	3473	3783	26	60	0.74	-0.73	1.66	6.3	0.1
20	2000	400	6.11	3794	4239	35	138	1.35	-1.32	2.41	10.3	0.2
20	2000	420	5.95	3880	4365	34	128	1.26	-1.24	2.30	10.1	0.2
20	2000	440	5.80	3960	4436	33	120	1.18	-1.16	2.21	9.8	0.2
20	2000	460	5.65	4035	4503	32	113	1.11	-1.10	2.12	9.6	0.2
20	2000	480	5.51	4105	4566	31	106	1.05	-1.03	2.04	9.3	0.2
20	2000	500	5.38	4171	4626	31	99	0.99	-0.98	1.96	9.1	0.2
20	2000	520	5.25	4232	4681	30	94	0.94	-0.93	1.89	8.9	0.2
20	2000	540	5.12	4290	4734	30	88	0.90	-0.88	1.83	8.7	0.2
20	2000	560	5.00	4345	4783	29	84	0.85	-0.84	1.77	8.5	0.2
20	2000	580	4.89	4396	4829	29	79	0.81	-0.80	1.71	8.3	0.2
20	2000	600	4.78	4443	4873	28	75	0.78	-0.77	1.66	8.1	0.2
20	2500	400	7.26	4492	5140	37	150	1.41	-1.38	2.39	12.3	0.3
20	2500	420	7.08	4602	5237	36	150	1.32	-1.30	2.29	12.0	0.3
20	2500	440	6.92	4706	5329	35	141	1.24	-1.22	2.19	11.7	0.3
20	2500	460	6.76	4804	5416	34	132	1.17	-1.15	2.11	11.4	0.3
20	2500	480	6.60	4897	5498	33	124	1.10	-1.08	2.03	11.2	0.3
20	2500	500	6.45	4984	5576	33	117	1.04	-1.02	1.95	10.9	0.3
20	2500	520	6.31	5066	5649	32	111	0.99	-0.97	1.89	10.7	0.3
20	2500	540	6.17	5143	5719	31	105	0.94	-0.92	1.82	10.4	0.3
20	2500	560	6.03	5216	5785	31	99	0.89	-0.88	1.76	10.2	0.3
20	2500	580	5.90	5285	5847	30	94	0.85	-0.84	1.71	10.0	0.3
20	2500	600	5.78	5349	5905	30	89	0.81	-0.80	1.65	9.8	0.3
20	3000	400	8.32	5136	5948	39	191	1.47	-1.44	2.36	14.1	0.4
20	3000	420	8.14	5271	6055	38	170	1.37	-1.34	2.27	13.8	0.4
20	3000	440	7.96	5399	6176	37	159	1.29	-1.26	2.18	13.5	0.4
20	3000	460	7.79	5520	6282	36	150	1.21	-1.19	2.09	13.2	0.4
20	3000	480	7.62	5634	6383	35	141	1.14	-1.12	2.02	12.9	0.4
20	3000	500	7.46	5742	6479	34	133	1.08	-1.06	1.95	12.6	0.4
20	3000	520	7.30	5845	6570	34	126	1.02	-1.01	1.89	12.3	0.4
20	3000	540	7.15	5942	6656	33	119	0.97	-0.96	1.82	12.1	0.4
20	3000	560	7.01	6034	6739	32	113	0.92	-0.91	1.76	11.8	0.4
20	3000	580	6.86	6121	6817	32	108	0.88	-0.87	1.70	11.6	0.4
20	3000	600	6.73	6202	6890	31	102	0.84	-0.83	1.65	11.4	0.4
20	3500	400	9.33	5738	6721	41	200	1.51	-1.48	2.34	15.8	0.5
20	3500	420	9.13	5897	6857	40	188	1.41	-1.39	2.25	15.4	0.5
20	3500	440	8.94	6047	6987	39	177	1.33	-1.30	2.16	15.1	0.5
20	3500	460	8.76	6190	7111	38	167	1.25	-1.23	2.08	14.8	0.5
20	3500	480	8.59	6326	7230	37	157	1.18	-1.16	2.01	14.5	0.5
20	3500	500	8.41	6455	7343	36	149	1.12	-1.10	1.94	14.2	0.5
20	3500	520	8.25	6578	7451	35	141	1.06	-1.04	1.87	13.9	0.5
20	3500	540	8.09	6695	7555	34	134	1.00	-0.99	1.81	13.7	0.5
20	3500	560	7.93	6806	7653	34	127	0.96	-0.94	1.75	13.4	0.5
20	3500	580	7.78	6911	7747	33	121	0.91	-0.90	1.70	13.1	0.5
20	3500	600	7.64	7009	7834	32	115	0.87	-0.86	1.65	12.9	0.5
20	4000	400	10.27	6305	7466	42	217	1.55	-1.52	2.33	17.4	0.6
20	4000	420	10.07	6486	7620	41	205	1.45	-1.42	2.23	17.0	0.6
20	4000	440	9.88	6659	7768	40	193	1.36	-1.34	2.15	16.7	0.6
20	4000	460	9.69	6824	7910	39	182	1.28	-1.26	2.07	16.4	0.6
20	4000	480	9.50	6981	8046	38	172	1.21	-1.19	2.00	16.1	0.6
20	4000	500	9.32	7130	8176	37	163	1.15	-1.13	1.93	15.8	0.6
20	4000	520	9.15	7273	8300	36	155	1.09	-1.07	1.86	15.5	0.6
20	4000	540	8.98	7409	8420	36	147	1.03	-1.02	1.80	15.2	0.6
20	4000	560	8.81	7539	8534	35	140	0.98	-0.97	1.75	14.9	0.6
20	4000	580	8.65	7662	8643	34	133	0.94	-0.92	1.69	14.6	0.6
20	4000	600	8.51	7776	8745	34	127	0.90	-0.88	1.64	14.4	0.6

Figure 6-68 (Sheet 9 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	4500	400	11.18	6841	8188	44	234	1.59	-1.55	2.31	18.9	0.7
20	4500	420	10.97	7045	8359	43	220	1.49	-1.46	2.22	18.5	0.7
20	4500	440	10.77	7239	8524	42	208	1.40	-1.37	2.13	18.2	0.7
20	4500	460	10.57	7425	8682	41	197	1.32	-1.29	2.06	17.9	0.7
20	4500	480	10.38	7603	8834	40	186	1.24	-1.22	1.99	17.5	0.7
20	4500	500	10.19	7772	8981	39	177	1.18	-1.16	1.92	17.2	0.7
20	4500	520	10.01	7934	9121	38	168	1.12	-1.10	1.85	16.9	0.7
20	4500	540	9.83	8089	9257	37	159	1.06	-1.04	1.80	16.6	0.7
20	4500	560	9.66	8237	9386	36	152	1.01	-0.99	1.74	16.3	0.7
20	4500	580	9.50	8378	9510	36	145	0.96	-0.95	1.69	16.0	0.7
20	4500	600	9.35	8509	9625	35	138	0.92	-0.91	1.64	15.8	0.7
20	5000	400	12.04	7352	8891	45	249	1.62	-1.58	2.29	20.3	0.8
20	5000	420	11.83	7577	9078	44	235	1.52	-1.49	2.20	20.0	0.8
20	5000	440	11.62	7792	9258	43	222	1.43	-1.40	2.12	19.6	0.8
20	5000	460	11.42	7998	9433	42	211	1.34	-1.32	2.05	19.3	0.8
20	5000	480	11.22	8196	9601	41	200	1.27	-1.25	1.97	19.0	0.8
20	5000	500	11.03	8385	9763	40	189	1.20	-1.18	1.91	18.6	0.8
20	5000	520	10.84	8566	9919	39	180	1.14	-1.12	1.85	18.3	0.8
20	5000	540	10.66	8740	10069	38	171	1.08	-1.07	1.79	18.0	0.8
20	5000	560	10.48	8906	10214	37	163	1.03	-1.02	1.73	17.7	0.8
20	5000	580	10.31	9064	10352	37	156	0.98	-0.97	1.68	17.4	0.8
20	5000	600	10.15	9210	10480	36	149	0.94	-0.93	1.64	17.2	0.8
20	5500	400	12.87	7840	9577	46	264	1.65	-1.61	2.27	21.8	0.9
20	5500	420	12.65	8086	9779	45	249	1.55	-1.51	2.19	21.4	0.9
20	5500	440	12.44	8321	9975	44	236	1.45	-1.43	2.11	21.0	0.9
20	5500	460	12.23	8548	10164	43	224	1.37	-1.34	2.03	20.7	0.9
20	5500	480	12.03	8764	10347	42	212	1.29	-1.27	1.96	20.3	0.9
20	5500	500	11.83	8973	10524	41	202	1.23	-1.21	1.90	20.0	0.9
20	5500	520	11.64	9172	10695	40	192	1.16	-1.14	1.84	19.7	0.9
20	5500	540	11.45	9364	10850	39	183	1.11	-1.09	1.78	19.3	0.9
20	5500	560	11.26	9548	11019	39	174	1.05	-1.04	1.73	19.0	0.9
20	5500	580	11.09	9723	11171	38	166	1.00	-0.99	1.68	18.7	0.9
20	5500	600	10.93	9885	11312	37	159	0.96	-0.95	1.63	18.5	0.9
20	6000	400	13.67	8308	10248	48	277	1.67	-1.64	2.25	23.1	1.0
20	6000	420	13.45	8574	10465	46	262	1.57	-1.54	2.17	22.7	1.0
20	6000	440	13.23	8829	10675	45	249	1.48	-1.45	2.09	22.4	1.0
20	6000	460	13.02	9075	10879	44	236	1.39	-1.37	2.02	22.0	1.0
20	6000	480	12.81	9311	11077	43	224	1.32	-1.29	1.95	21.6	1.0
20	6000	500	12.61	9538	11268	42	213	1.25	-1.23	1.89	21.3	1.0
20	6000	520	12.41	9756	11453	41	203	1.18	-1.16	1.83	21.0	1.0
20	6000	540	12.21	9965	11632	40	194	1.13	-1.11	1.77	20.6	1.0
20	6000	560	12.03	10167	11805	40	185	1.07	-1.06	1.72	20.3	1.0
20	6000	580	11.85	10358	11970	39	177	1.02	-1.01	1.67	20.0	1.0
20	6000	600	11.69	10534	12123	38	169	0.98	-0.97	1.63	19.8	1.1
20	6500	400	14.44	8758	10907	49	290	1.70	-1.66	2.24	24.4	1.1
20	6500	420	14.21	9044	11137	47	275	1.59	-1.56	2.16	24.0	1.1
20	6500	440	13.99	9319	11362	46	261	1.50	-1.47	2.08	23.6	1.1
20	6500	460	13.78	9583	11579	45	248	1.42	-1.39	2.01	23.3	1.1
20	6500	480	13.56	9837	11791	44	236	1.34	-1.31	1.94	22.9	1.1
20	6500	500	13.36	10082	11996	43	224	1.27	-1.25	1.88	22.6	1.1
20	6500	520	13.15	10318	12195	42	214	1.20	-1.18	1.82	22.2	1.1
20	6500	540	12.96	10545	12388	41	204	1.15	-1.13	1.77	21.9	1.1
20	6500	560	12.77	10763	12574	41	195	1.09	-1.07	1.72	21.6	1.1
20	6500	580	12.59	10970	12752	40	186	1.04	-1.03	1.67	21.3	1.1
20	6500	600	12.43	11161	12916	39	179	1.00	-0.98	1.63	21.0	1.2
20	7000	400	15.18	9193	11555	50	303	1.72	-1.68	2.22	25.7	1.2
20	7000	420	14.96	9497	11798	48	287	1.61	-1.58	2.14	25.3	1.2
20	7000	440	14.73	9791	12036	47	272	1.52	-1.49	2.07	24.9	1.2
20	7000	460	14.51	10074	12267	46	259	1.44	-1.41	2.00	24.5	1.2
20	7000	480	14.30	10346	12492	45	246	1.36	-1.33	1.93	24.2	1.2
20	7000	500	14.09	10609	12710	44	235	1.29	-1.26	1.87	23.8	1.2
20	7000	520	13.88	10862	12922	43	224	1.22	-1.20	1.82	23.5	1.2
20	7000	540	13.68	11106	13128	42	214	1.16	-1.14	1.76	23.1	1.2
20	7000	560	13.49	11341	13327	42	205	1.11	-1.09	1.71	22.8	1.2
20	7000	580	13.31	11563	13517	41	196	1.06	-1.04	1.66	22.5	1.3
20	7000	600	13.15	11768	13692	40	188	1.02	-1.00	1.62	22.2	1.3

**Figure 6-68 (Sheet 10 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	7500	400	15.91	9613	12193	51	314	1.74	-1.70	2.20	26.9	1.3
20	7500	420	15.68	9936	12449	49	298	1.63	-1.60	2.13	26.5	1.3
20	7500	440	15.45	10248	12699	48	283	1.54	-1.51	2.06	26.1	1.3
20	7500	460	15.23	10545	12943	47	270	1.45	-1.43	1.99	25.7	1.3
20	7500	480	15.01	10839	13181	46	257	1.38	-1.35	1.92	25.4	1.3
20	7500	500	14.79	11119	13412	45	245	1.31	-1.28	1.86	25.0	1.3
20	7500	520	14.58	11389	13637	44	234	1.24	-1.22	1.81	24.6	1.3
20	7500	540	14.38	11650	13855	43	224	1.18	-1.16	1.75	24.3	1.3
20	7500	560	14.19	11900	14066	42	214	1.12	-1.11	1.70	24.0	1.4
20	7500	580	14.01	12137	14267	42	205	1.08	-1.06	1.66	23.7	1.4
20	7500	600	13.85	12355	14453	41	197	1.03	-1.02	1.62	23.4	1.5
20	8000	400	16.61	10020	12822	52	325	1.75	-1.72	2.19	28.1	1.4
20	8000	420	16.38	10361	13090	50	309	1.65	-1.62	2.11	27.7	1.4
20	8000	440	16.15	10691	13353	49	294	1.56	-1.53	2.04	27.3	1.4
20	8000	460	15.92	11005	13609	48	280	1.47	-1.44	1.98	26.9	1.4
20	8000	480	15.70	11316	13859	47	267	1.39	-1.37	1.91	26.5	1.4
20	8000	500	15.48	11613	14102	46	255	1.32	-1.30	1.86	26.2	1.4
20	8000	520	15.27	11900	14339	45	243	1.26	-1.23	1.80	25.8	1.5
20	8000	540	15.06	12177	14570	44	233	1.20	-1.18	1.75	25.5	1.5
20	8000	560	14.87	12443	14793	43	223	1.14	-1.12	1.70	25.1	1.5
20	8000	580	14.69	12694	15004	43	214	1.09	-1.07	1.65	24.8	1.5
20	8000	600	14.54	12925	15200	42	206	1.05	-1.03	1.62	24.6	1.6
20	8500	400	17.29	10416	13444	52	336	1.77	-1.73	2.17	29.2	1.5
20	8500	420	17.06	10774	13724	51	320	1.67	-1.63	2.10	28.8	1.5
20	8500	440	16.82	11121	13998	50	304	1.57	-1.54	2.03	28.4	1.5
20	8500	460	16.60	11456	14265	49	290	1.49	-1.46	1.97	28.0	1.5
20	8500	480	16.37	11781	14527	48	277	1.41	-1.38	1.90	27.7	1.6
20	8500	500	16.15	12094	14782	47	264	1.34	-1.31	1.85	27.3	1.6
20	8500	520	15.94	12397	15031	46	253	1.27	-1.25	1.79	26.9	1.6
20	8500	540	15.73	12690	15274	45	242	1.21	-1.19	1.74	26.6	1.6
20	8500	560	15.54	12971	15508	44	232	1.15	-1.14	1.69	26.3	1.6
20	8500	580	15.36	13235	15730	43	222	1.11	-1.09	1.65	26.0	1.7
20	8500	600	15.21	13478	15934	43	214	1.06	-1.05	1.61	25.7	1.8
20	9000	400	17.96	10800	14059	53	346	1.78	-1.75	2.16	30.4	1.6
20	9000	420	17.72	11176	14349	52	330	1.68	-1.65	2.09	29.9	1.6
20	9000	440	17.49	11540	14634	51	314	1.59	-1.56	2.02	29.6	1.6
20	9000	460	17.26	11892	14914	50	299	1.50	-1.47	1.96	29.2	1.7
20	9000	480	17.03	12232	15187	49	286	1.42	-1.40	1.90	28.8	1.7
20	9000	500	16.81	12562	15453	48	273	1.35	-1.33	1.84	28.4	1.7
20	9000	520	16.59	12881	15714	47	261	1.28	-1.26	1.78	28.0	1.7
20	9000	540	16.39	13189	15967	46	250	1.22	-1.20	1.73	27.7	1.7
20	9000	560	16.19	13485	16213	45	240	1.17	-1.15	1.69	27.4	1.7
20	9000	580	16.02	13762	16443	44	231	1.12	-1.10	1.65	27.1	1.8
20	9000	600	15.87	14015	16656	43	222	1.08	-1.06	1.61	26.8	2.0
20	9500	400	18.61	11174	14667	54	356	1.80	-1.76	2.14	31.5	1.7
20	9500	420	18.37	11567	14968	53	339	1.69	-1.66	2.07	31.0	1.7
20	9500	440	18.13	11947	15264	51	323	1.60	-1.57	2.01	30.6	1.7
20	9500	460	17.90	12316	15554	50	309	1.51	-1.49	1.94	30.3	1.8
20	9500	480	17.67	12673	15838	49	295	1.44	-1.41	1.89	29.9	1.8
20	9500	500	17.45	13018	16116	48	282	1.36	-1.34	1.83	29.5	1.8
20	9500	520	17.23	13353	16387	47	270	1.30	-1.28	1.78	29.1	1.8
20	9500	540	17.02	13676	16652	46	259	1.24	-1.22	1.73	28.8	1.8
20	9500	560	16.83	13986	16907	46	248	1.18	-1.16	1.68	28.4	1.9
20	9500	580	16.66	14274	17147	45	239	1.13	-1.11	1.64	28.2	2.0
20	9500	600	16.52	14538	17367	44	230	1.09	-1.07	1.61	27.9	2.1
20	10000	400	19.25	11539	15270	55	366	1.81	-1.77	2.13	32.5	1.8
20	10000	420	19.00	11949	15581	53	348	1.71	-1.67	2.06	32.1	1.8
20	10000	440	18.77	12345	15887	52	332	1.61	-1.58	2.00	31.7	1.9
20	10000	460	18.53	12730	16188	51	317	1.53	-1.50	1.93	31.3	1.9
20	10000	480	18.30	13102	16482	50	303	1.45	-1.42	1.88	30.9	1.9
20	10000	500	18.08	13463	16771	49	290	1.38	-1.35	1.82	30.6	1.9
20	10000	520	17.86	13813	17053	48	278	1.31	-1.29	1.77	30.2	1.9
20	10000	540	17.65	14151	17328	47	267	1.25	-1.23	1.72	29.8	1.9
20	10000	560	17.46	14474	17593	46	256	1.19	-1.17	1.68	29.5	2.0
20	10000	580	17.30	14774	17840	46	246	1.14	-1.13	1.64	29.2	2.1
20	10000	600	17.16	15048	18067	45	238	1.10	-1.09	1.61	29.0	2.3

Figure 6-68 (Sheet 11 of 20)

## **Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	1500	400	3.77	2173	2640	39	83	1.56	-1.54	2.41	6.4	0.1
30	1500	420	3.64	2201	2664	38	77	1.47	-1.45	2.31	6.2	0.1
30	1500	440	3.52	2227	2685	37	71	1.38	-1.37	2.21	5.9	0.1
30	1500	460	3.40	2251	2705	37	66	1.31	-1.30	2.12	5.7	0.1
30	1500	480	3.29	2272	2723	36	62	1.24	-1.23	2.04	5.6	0.1
30	1500	500	3.18	2292	2739	36	58	1.18	-1.17	1.96	5.4	0.1
30	1500	520	3.08	2310	2754	36	54	1.13	-1.12	1.89	5.2	0.1
30	1500	540	2.99	2326	2768	35	51	1.08	-1.07	1.83	5.1	0.1
30	1500	560	2.90	2341	2780	35	48	1.03	-1.03	1.76	4.9	0.1
30	1500	580	2.82	2355	2792	35	45	0.99	-0.98	1.71	4.8	0.1
30	1500	600	2.74	2368	2803	34	43	0.95	-0.95	1.65	4.6	0.1
30	2000	400	4.84	2778	3423	41	102	1.62	-1.60	2.39	8.2	0.2
30	2000	420	4.68	2821	3458	40	95	1.52	-1.51	2.29	7.9	0.2
30	2000	440	4.53	2860	3490	39	88	1.44	-1.42	2.19	7.7	0.1
30	2000	460	4.39	2897	3520	39	82	1.36	-1.35	2.11	7.4	0.1
30	2000	480	4.25	2930	3547	38	77	1.29	-1.28	2.03	7.2	0.1
30	2000	500	4.13	2961	3573	38	72	1.23	-1.21	1.95	7.0	0.1
30	2000	520	4.01	2989	3596	37	68	1.17	-1.16	1.88	6.8	0.1
30	2000	540	3.89	3015	3618	37	64	1.11	-1.11	1.82	6.6	0.1
30	2000	560	3.78	3039	3638	36	60	1.07	-1.06	1.76	6.4	0.1
30	2000	580	3.68	3061	3656	36	57	1.02	-1.01	1.70	6.2	0.1
30	2000	600	3.58	3081	3673	36	54	0.98	-0.98	1.65	6.1	0.1
30	2500	400	5.84	3343	4174	42	120	1.67	-1.65	2.37	9.9	0.2
30	2500	420	5.66	3401	4221	42	112	1.57	-1.55	2.27	9.6	0.2
30	2500	440	5.49	3455	4265	41	104	1.48	-1.47	2.18	9.3	0.2
30	2500	460	5.33	3505	4305	40	97	1.40	-1.39	2.09	9.0	0.2
30	2500	480	5.17	3551	4343	40	91	1.33	-1.32	2.01	8.7	0.2
30	2500	500	5.03	3594	4378	39	86	1.26	-1.25	1.94	8.5	0.2
30	2500	520	4.89	3633	4410	38	80	1.20	-1.19	1.87	8.3	0.2
30	2500	540	4.75	3670	4440	38	76	1.15	-1.14	1.81	8.0	0.2
30	2500	560	4.63	3704	4469	38	71	1.10	-1.09	1.75	7.8	0.2
30	2500	580	4.50	3735	4495	37	67	1.05	-1.04	1.69	7.6	0.2
30	2500	600	4.39	3764	4519	37	64	1.01	-1.00	1.64	7.4	0.2
30	3000	400	6.79	3874	4900	44	137	1.72	-1.70	2.34	11.5	0.3
30	3000	420	6.59	3949	4959	43	128	1.62	-1.60	2.25	11.1	0.3
30	3000	440	6.40	4018	5014	42	119	1.52	-1.51	2.16	10.8	0.3
30	3000	460	6.22	4082	5066	42	112	1.44	-1.42	2.08	10.5	0.3
30	3000	480	6.05	4141	5114	41	105	1.37	-1.35	2.00	10.2	0.3
30	3000	500	5.89	4197	5159	40	98	1.30	-1.28	1.93	10.0	0.3
30	3000	520	5.73	4248	5200	40	92	1.23	-1.22	1.86	9.7	0.3
30	3000	540	5.58	4296	5240	39	87	1.18	-1.17	1.80	9.4	0.2
30	3000	560	5.44	4340	5276	39	82	1.13	-1.12	1.74	9.2	0.2
30	3000	580	5.30	4382	5310	38	78	1.08	-1.07	1.69	9.0	0.2
30	3000	600	5.18	4420	5342	38	74	1.03	-1.03	1.64	8.7	0.2
30	3500	400	7.69	4377	5604	46	152	1.76	-1.73	2.32	13.0	0.4
30	3500	420	7.48	4468	5675	45	142	1.65	-1.63	2.23	12.6	0.4
30	3500	440	7.28	4552	5742	44	133	1.56	-1.54	2.14	12.3	0.3
30	3500	460	7.08	4631	5805	43	125	1.47	-1.46	2.06	12.0	0.3
30	3500	480	6.89	4704	5863	42	117	1.40	-1.38	1.99	11.7	0.3
30	3500	500	6.72	4772	5918	42	110	1.33	-1.31	1.92	11.4	0.3
30	3500	520	6.54	4836	5970	41	104	1.26	-1.25	1.85	11.1	0.3
30	3500	540	6.38	4896	6018	40	98	1.20	-1.19	1.79	10.8	0.3
30	3500	560	6.22	4951	6063	40	93	1.15	-1.14	1.73	10.5	0.3
30	3500	580	6.07	5003	6106	39	88	1.10	-1.09	1.68	10.3	0.3
30	3500	600	5.94	5051	6145	39	83	1.06	-1.05	1.63	10.0	0.3
30	4000	400	8.56	4856	6291	47	167	1.80	-1.77	2.30	14.5	0.4
30	4000	420	8.33	4962	6374	46	156	1.69	-1.66	2.21	14.1	0.4
30	4000	440	8.11	5062	6452	45	146	1.59	-1.57	2.13	13.7	0.4
30	4000	460	7.91	5155	6525	44	137	1.51	-1.49	2.05	13.4	0.4
30	4000	480	7.71	5243	6594	43	129	1.43	-1.41	1.97	13.0	0.4
30	4000	500	7.51	5324	6659	43	122	1.35	-1.34	1.91	12.7	0.4
30	4000	520	7.33	5401	6721	42	115	1.29	-1.28	1.84	12.4	0.4
30	4000	540	7.15	5472	6778	41	109	1.23	-1.22	1.78	12.1	0.4
30	4000	560	6.98	5539	6833	41	103	1.17	-1.16	1.73	11.8	0.4
30	4000	580	6.82	5602	6884	40	97	1.12	-1.11	1.68	11.5	0.4
30	4000	600	6.67	5660	6930	40	93	1.08	-1.07	1.63	11.3	0.4

**Figure 6-68 (Sheet 12 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	4500	400	9.39	5313	6952	48	130	1.83	-1.80	2.28	15.9	0.5
30	4500	420	9.15	5436	7157	47	169	1.72	-1.69	2.19	15.5	0.5
30	4500	440	8.92	5551	7146	46	159	1.62	-1.60	2.11	15.1	0.5
30	4500	460	8.70	5659	7230	45	149	1.53	-1.51	2.03	14.7	0.5
30	4500	480	8.49	5763	7309	45	141	1.45	-1.43	1.96	14.3	0.5
30	4500	500	8.29	5855	7334	44	133	1.38	-1.36	1.90	14.0	0.5
30	4500	520	8.09	5944	7455	43	125	1.31	-1.30	1.83	13.7	0.5
30	4500	540	7.90	6023	7522	43	119	1.25	-1.24	1.78	13.4	0.5
30	4500	560	7.72	6107	7596	42	112	1.20	-1.18	1.72	13.0	0.5
30	4500	580	7.55	6180	7645	41	107	1.15	-1.13	1.67	12.8	0.5
30	4500	600	7.39	6248	7700	41	101	1.10	-1.09	1.62	12.5	0.5
30	5000	400	10.18	5751	7621	49	133	1.85	-1.83	2.26	17.2	0.6
30	5000	420	9.94	5893	7726	48	131	1.75	-1.72	2.17	16.8	0.6
30	5000	440	9.70	6020	7826	47	170	1.65	-1.62	2.09	16.4	0.6
30	5000	460	9.47	6143	7920	47	161	1.56	-1.54	2.02	16.0	0.6
30	5000	480	9.25	6259	8010	46	151	1.48	-1.46	1.95	15.6	0.6
30	5000	500	9.03	6366	8095	45	143	1.40	-1.39	1.89	15.3	0.6
30	5000	520	8.83	6469	8176	44	135	1.34	-1.32	1.82	14.9	0.6
30	5000	540	8.63	6565	8252	43	128	1.27	-1.26	1.77	14.6	0.5
30	5000	560	8.44	6655	8324	43	122	1.22	-1.20	1.71	14.3	0.5
30	5000	580	8.26	6740	8392	42	115	1.16	-1.15	1.66	14.0	0.5
30	5000	600	8.10	6818	8455	42	110	1.12	-1.11	1.62	13.7	0.6
30	5500	400	10.95	6173	8268	50	205	1.88	-1.85	2.24	18.5	0.7
30	5500	420	10.70	6327	8384	49	193	1.77	-1.74	2.16	18.1	0.7
30	5500	440	10.45	6473	8494	48	182	1.67	-1.65	2.08	17.7	0.7
30	5500	460	10.21	6610	8599	48	171	1.58	-1.56	2.01	17.3	0.7
30	5500	480	9.98	6739	8693	47	162	1.50	-1.48	1.94	16.9	0.7
30	5500	500	9.76	6861	8793	46	153	1.42	-1.41	1.88	16.5	0.6
30	5500	520	9.54	6976	8883	45	145	1.36	-1.34	1.82	16.1	0.6
30	5500	540	9.34	7084	8969	44	137	1.29	-1.28	1.76	15.8	0.6
30	5500	560	9.14	7187	9050	44	130	1.24	-1.22	1.71	15.4	0.6
30	5500	580	8.95	7283	9126	43	124	1.18	-1.17	1.66	15.1	0.6
30	5500	600	8.78	7370	9196	43	118	1.14	-1.13	1.61	14.8	0.7
30	6000	400	11.70	6579	8904	51	217	1.90	-1.87	2.22	19.8	0.8
30	6000	420	11.44	6749	9031	50	204	1.79	-1.77	2.14	19.3	0.8
30	6000	440	11.18	6909	9151	49	192	1.69	-1.67	2.06	18.9	0.8
30	6000	460	10.93	7061	9266	48	182	1.60	-1.58	1.99	18.5	0.8
30	6000	480	10.69	7204	9375	48	172	1.52	-1.50	1.93	18.1	0.7
30	6000	500	10.46	7339	9480	47	163	1.44	-1.43	1.87	17.7	0.7
30	6000	520	10.24	7467	9579	46	154	1.37	-1.36	1.81	17.3	0.7
30	6000	540	10.02	7588	9674	45	146	1.31	-1.30	1.75	16.9	0.7
30	6000	560	9.82	7703	9764	45	139	1.25	-1.24	1.70	16.6	0.7
30	6000	580	9.63	7809	9848	44	132	1.20	-1.19	1.65	16.3	0.7
30	6000	600	9.45	7907	9926	43	126	1.15	-1.14	1.61	16.0	0.8
30	6500	400	12.42	6972	9532	52	223	1.92	-1.89	2.20	21.0	0.9
30	6500	420	12.15	7157	9668	51	215	1.81	-1.79	2.12	20.5	0.9
30	6500	440	11.89	7332	9799	50	203	1.71	-1.69	2.05	20.1	0.8
30	6500	460	11.63	7498	9923	49	191	1.62	-1.60	1.98	19.7	0.8
30	6500	480	11.39	7655	10042	48	181	1.54	-1.52	1.92	19.2	0.8
30	6500	500	11.15	7804	10156	48	172	1.46	-1.44	1.86	18.8	0.8
30	6500	520	10.92	7944	10265	47	163	1.39	-1.38	1.80	18.5	0.8
30	6500	540	10.70	8079	10368	46	155	1.33	-1.31	1.74	18.1	0.8
30	6500	560	10.48	8204	10467	45	147	1.27	-1.26	1.69	17.7	0.8
30	6500	580	10.29	8321	10559	45	140	1.22	-1.20	1.65	17.4	0.8
30	6500	600	10.11	8429	10644	44	134	1.17	-1.16	1.61	17.1	0.9
30	7000	400	13.13	7353	10152	53	238	1.94	-1.91	2.19	22.2	1.0
30	7000	420	12.85	7553	10298	52	225	1.83	-1.80	2.11	21.7	0.9
30	7000	440	12.58	7742	10438	51	212	1.73	-1.71	2.04	21.3	0.9
30	7000	460	12.32	7922	10572	50	201	1.64	-1.62	1.97	20.8	0.9
30	7000	480	12.06	8093	10700	49	190	1.55	-1.53	1.91	20.4	0.9
30	7000	500	11.82	8254	10823	48	180	1.48	-1.46	1.85	20.0	0.9
30	7000	520	11.58	8408	10941	48	171	1.41	-1.39	1.79	19.6	0.9
30	7000	540	11.35	8554	11053	47	163	1.34	-1.33	1.74	19.2	0.9
30	7000	560	11.13	8691	11160	46	155	1.28	-1.27	1.69	18.8	0.9
30	7000	580	10.93	8820	11260	46	148	1.23	-1.22	1.64	18.5	0.9
30	7000	600	10.76	8936	11352	45	142	1.19	-1.17	1.60	18.2	1.0

Figure 6-68 (Sheet 13 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	7500	400	13.21	7722	10765	54	248	1.96	-1.93	2.17	23.3	1.0
30	7500	420	13.53	7937	10920	53	234	1.85	-1.82	2.09	22.9	1.0
30	7500	440	13.25	8141	11069	52	222	1.75	-1.72	2.02	22.4	1.0
30	7500	460	12.98	8334	11212	51	210	1.65	-1.63	1.96	21.9	1.0
30	7500	480	12.72	8518	11350	50	199	1.57	-1.55	1.89	21.5	1.0
30	7500	500	12.47	8693	11481	49	189	1.49	-1.47	1.84	21.1	1.0
30	7500	520	12.23	8860	11608	48	180	1.42	-1.41	1.78	20.7	1.0
30	7500	540	11.99	9017	11729	48	171	1.36	-1.34	1.73	20.3	1.0
30	7500	560	11.77	9167	11844	47	163	1.30	-1.28	1.68	19.9	1.0
30	7500	580	11.57	9305	11951	46	155	1.25	-1.23	1.64	19.6	1.0
30	7500	600	11.39	9431	12050	46	149	1.20	-1.19	1.60	19.3	1.1
30	8000	400	14.48	8081	11371	55	258	1.97	-1.94	2.15	24.5	1.1
30	8000	420	14.19	8310	11535	54	244	1.86	-1.83	2.08	24.0	1.1
30	8000	440	13.91	8528	11693	53	231	1.76	-1.74	2.01	23.5	1.1
30	8000	460	13.63	8736	11845	52	219	1.67	-1.65	1.95	23.0	1.1
30	8000	480	13.37	8933	11992	51	207	1.59	-1.56	1.88	22.6	1.1
30	8000	500	13.11	9121	12132	50	197	1.51	-1.49	1.83	22.2	1.1
30	8000	520	12.86	9299	12267	49	187	1.44	-1.42	1.77	21.7	1.1
30	8000	540	12.62	9469	12396	48	179	1.37	-1.36	1.72	21.3	1.1
30	8000	560	12.40	9630	12519	48	170	1.31	-1.30	1.67	21.0	1.1
30	8000	580	12.19	9778	12634	47	163	1.26	-1.25	1.63	20.6	1.1
30	8000	600	12.02	9913	12739	46	156	1.21	-1.20	1.59	20.3	1.2
30	8500	400	15.13	8431	11972	56	267	1.99	-1.96	2.14	25.6	1.2
30	8500	420	14.83	8674	12144	55	252	1.88	-1.85	2.06	25.1	1.2
30	8500	440	14.55	8906	12311	53	239	1.78	-1.75	2.00	24.6	1.2
30	8500	460	14.27	9127	12472	52	227	1.68	-1.66	1.93	24.1	1.2
30	8500	480	14.00	9337	12627	52	216	1.60	-1.58	1.87	23.7	1.2
30	8500	500	13.74	9538	12776	51	205	1.52	-1.50	1.82	23.2	1.2
30	8500	520	13.48	9729	12919	50	195	1.45	-1.43	1.76	22.8	1.2
30	8500	540	13.24	9911	13056	49	186	1.39	-1.37	1.71	22.4	1.2
30	8500	560	13.01	10082	13187	48	177	1.33	-1.31	1.67	22.0	1.2
30	8500	580	12.81	10241	13319	48	170	1.27	-1.26	1.63	21.6	1.3
30	8500	600	12.63	10384	13449	47	163	1.23	-1.21	1.59	21.4	1.4
30	9000	400	15.77	8771	12567	56	275	2.00	-1.97	2.12	26.6	1.3
30	9000	420	15.47	9028	12748	55	261	1.89	-1.86	2.05	26.1	1.3
30	9000	440	15.18	9274	12923	54	248	1.79	-1.76	1.98	25.6	1.3
30	9000	460	14.89	9508	13092	53	235	1.70	-1.67	1.92	25.2	1.3
30	9000	480	14.62	9732	13255	52	223	1.61	-1.59	1.86	24.7	1.3
30	9000	500	14.35	9945	13413	51	213	1.53	-1.51	1.81	24.2	1.3
30	9000	520	14.09	10148	13564	51	203	1.46	-1.44	1.76	23.8	1.3
30	9000	540	13.84	10342	13709	50	193	1.40	-1.38	1.71	23.4	1.3
30	9000	560	13.62	10524	13848	49	184	1.34	-1.32	1.66	23.0	1.3
30	9000	580	13.41	10692	13976	48	177	1.29	-1.27	1.62	22.7	1.4
30	9000	600	13.24	10843	14092	48	170	1.24	-1.23	1.59	22.4	1.5
30	9500	400	16.39	9103	13158	57	284	2.01	-1.98	2.10	27.7	1.4
30	9500	420	16.08	9375	13347	56	269	1.90	-1.87	2.04	27.2	1.4
30	9500	440	15.79	9634	13530	55	256	1.80	-1.77	1.97	26.7	1.4
30	9500	460	15.50	9881	13707	54	243	1.71	-1.68	1.91	26.2	1.4
30	9500	480	15.22	10117	13878	53	231	1.62	-1.60	1.85	25.7	1.4
30	9500	500	14.95	10343	14044	52	220	1.55	-1.53	1.80	25.3	1.4
30	9500	520	14.69	10558	14203	51	210	1.48	-1.46	1.75	24.8	1.4
30	9500	540	14.44	10763	14356	50	200	1.41	-1.39	1.70	24.4	1.4
30	9500	560	14.21	10956	14501	50	191	1.35	-1.33	1.66	24.0	1.4
30	9500	580	14.01	11133	14635	49	183	1.30	-1.28	1.62	23.7	1.5
30	9500	600	13.84	11292	14757	48	176	1.25	-1.24	1.58	23.4	1.7
30	10000	400	17.00	9428	13744	58	292	2.02	-1.99	2.09	28.7	1.5
30	10000	420	16.69	9713	13940	56	277	1.91	-1.88	2.02	28.2	1.5
30	10000	440	16.39	9985	14132	55	263	1.81	-1.79	1.96	27.7	1.5
30	10000	460	16.10	10245	14317	54	250	1.72	-1.70	1.90	27.2	1.5
30	10000	480	15.81	10494	14496	54	238	1.64	-1.61	1.84	26.7	1.5
30	10000	500	15.54	10732	14669	53	227	1.56	-1.54	1.79	26.3	1.5
30	10000	520	15.28	10959	14836	52	217	1.49	-1.47	1.74	25.8	1.5
30	10000	540	15.03	11176	14996	51	207	1.42	-1.40	1.69	25.4	1.5
30	10000	560	14.80	11379	15148	50	198	1.36	-1.35	1.65	25.0	1.5
30	10000	580	14.60	11564	15288	50	190	1.31	-1.30	1.61	24.7	1.6
30	10000	600	14.43	11731	15415	49	183	1.27	-1.25	1.58	24.4	1.8

**Figure 6-68 (Sheet 14 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	1500	400	3.11	1583	2131	46	63	1.82	-1.81	2.41	5.3	0.1
40	1500	420	2.99	1598	2132	46	58	1.72	-1.71	2.30	5.0	0.1
40	1500	440	2.87	1611	2222	45	54	1.63	-1.62	2.21	4.9	0.1
40	1500	460	2.77	1623	2210	45	50	1.55	-1.54	2.12	4.7	0.1
40	1500	480	2.67	1634	2218	45	47	1.48	-1.47	2.03	4.5	0.1
40	1500	500	2.58	1644	2225	44	44	1.41	-1.41	1.96	4.4	0.1
40	1500	520	2.49	1653	2232	44	41	1.35	-1.35	1.89	4.2	0.1
40	1500	540	2.41	1661	2238	44	39	1.30	-1.29	1.82	4.1	0.1
40	1500	560	2.34	1668	2244	44	36	1.24	-1.24	1.76	3.9	0.1
40	1500	580	2.26	1675	2249	43	34	1.20	-1.19	1.70	3.8	0.1
40	1500	600	2.20	1681	2253	43	33	1.15	-1.15	1.65	3.7	0.1
40	2000	400	4.03	2043	2863	48	77	1.87	-1.85	2.38	6.8	0.1
40	2000	420	3.88	2071	2879	47	72	1.77	-1.75	2.28	6.6	0.1
40	2000	440	3.74	2093	2895	47	67	1.67	-1.66	2.19	6.3	0.1
40	2000	460	3.61	2112	2908	46	62	1.59	-1.58	2.10	6.1	0.1
40	2000	480	3.49	2129	2921	46	58	1.51	-1.50	2.02	5.9	0.1
40	2000	500	3.38	2145	2933	46	54	1.44	-1.44	1.94	5.7	0.1
40	2000	520	3.27	2159	2943	45	51	1.38	-1.37	1.88	5.5	0.1
40	2000	540	3.16	2172	2953	45	48	1.32	-1.32	1.81	5.3	0.1
40	2000	560	3.07	2185	2962	45	45	1.27	-1.26	1.75	5.2	0.1
40	2000	580	2.98	2196	2970	44	42	1.22	-1.21	1.69	5.0	0.1
40	2000	600	2.89	2206	2977	44	40	1.17	-1.17	1.64	4.9	0.1
40	2500	400	4.91	2483	3528	49	91	1.91	-1.89	2.35	8.3	0.2
40	2500	420	4.74	2522	3551	49	85	1.80	-1.79	2.26	8.0	0.2
40	2500	440	4.58	2552	3572	48	79	1.71	-1.70	2.17	7.7	0.2
40	2500	460	4.43	2579	3592	48	73	1.62	-1.61	2.08	7.5	0.2
40	2500	480	4.28	2604	3610	47	69	1.54	-1.53	2.00	7.2	0.2
40	2500	500	4.15	2626	3626	47	64	1.47	-1.46	1.93	7.0	0.1
40	2500	520	4.02	2647	3641	46	60	1.41	-1.40	1.86	6.8	0.1
40	2500	540	3.90	2666	3655	46	57	1.35	-1.34	1.80	6.6	0.1
40	2500	560	3.78	2684	3668	46	53	1.29	-1.29	1.74	6.4	0.1
40	2500	580	3.67	2700	3679	45	50	1.24	-1.24	1.69	6.2	0.1
40	2500	600	3.57	2714	3690	45	48	1.19	-1.19	1.64	6.0	0.1
40	3000	400	5.76	2910	4179	51	104	1.95	-1.93	2.33	9.7	0.2
40	3000	420	5.57	2953	4209	50	97	1.84	-1.82	2.23	9.4	0.2
40	3000	440	5.38	2992	4237	49	90	1.74	-1.73	2.15	9.1	0.2
40	3000	460	5.21	3028	4262	49	84	1.65	-1.64	2.07	8.8	0.2
40	3000	480	5.05	3060	4286	48	79	1.57	-1.56	1.99	8.5	0.2
40	3000	500	4.89	3091	4317	48	74	1.50	-1.49	1.92	8.3	0.2
40	3000	520	4.74	3118	4327	47	69	1.43	-1.42	1.85	8.0	0.2
40	3000	540	4.61	3144	4345	47	65	1.37	-1.36	1.79	7.8	0.2
40	3000	560	4.47	3167	4362	46	61	1.31	-1.31	1.73	7.6	0.2
40	3000	580	4.35	3189	4378	46	58	1.26	-1.25	1.68	7.4	0.2
40	3000	600	4.23	3209	4393	46	55	1.21	-1.21	1.63	7.2	0.2
40	3500	400	6.57	3312	4819	52	116	1.98	-1.96	2.30	11.1	0.3
40	3500	420	6.36	3366	4856	51	108	1.87	-1.85	2.21	10.7	0.3
40	3500	440	6.16	3414	4890	50	101	1.77	-1.75	2.13	10.4	0.3
40	3500	460	5.97	3459	4921	50	94	1.68	-1.66	2.05	10.1	0.3
40	3500	480	5.79	3501	4950	49	88	1.60	-1.58	1.98	9.8	0.3
40	3500	500	5.62	3539	4977	49	83	1.52	-1.51	1.91	9.5	0.2
40	3500	520	5.45	3574	5002	48	78	1.45	-1.44	1.84	9.2	0.2
40	3500	540	5.30	3606	5026	48	73	1.39	-1.38	1.78	9.0	0.2
40	3500	560	5.15	3636	5047	47	69	1.33	-1.32	1.72	8.7	0.2
40	3500	580	5.01	3664	5067	47	65	1.28	-1.27	1.67	8.5	0.2
40	3500	600	4.88	3689	5085	47	62	1.23	-1.23	1.62	8.3	0.2
40	4000	400	7.36	3698	5448	53	128	2.01	-1.99	2.28	12.4	0.4
40	4000	420	7.13	3763	5492	52	119	1.89	-1.88	2.19	12.0	0.3
40	4000	440	6.91	3822	5532	51	111	1.79	-1.78	2.11	11.7	0.3
40	4000	460	6.70	3876	5570	51	104	1.70	-1.69	2.03	11.3	0.3
40	4000	480	6.51	3926	5605	50	98	1.62	-1.61	1.96	11.0	0.3
40	4000	500	6.32	3973	5638	50	92	1.54	-1.53	1.89	10.7	0.3
40	4000	520	6.14	4016	5668	49	86	1.47	-1.46	1.83	10.4	0.3
40	4000	540	5.97	4056	5696	49	81	1.41	-1.40	1.77	10.1	0.3
40	4000	560	5.81	4092	5723	48	77	1.35	-1.34	1.72	9.8	0.3
40	4000	580	5.66	4126	5747	48	73	1.30	-1.29	1.66	9.6	0.3
40	4000	600	5.52	4158	5769	47	69	1.25	-1.24	1.62	9.3	0.3

Figure 6-68 (Sheet 15 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	4500	400	8.11	4073	6068	54	139	2.33	-2.01	2.26	13.7	0.4
40	4500	420	7.87	4146	6118	53	129	1.92	-1.90	2.17	13.3	0.4
40	4500	440	7.64	4215	6166	52	121	1.82	-1.80	2.09	12.9	0.4
40	4500	460	7.42	4279	6210	52	113	1.72	-1.71	2.02	12.5	0.4
40	4500	480	7.21	4339	6251	51	107	1.64	-1.63	1.95	12.2	0.4
40	4500	500	7.01	4394	6289	50	100	1.56	-1.55	1.88	11.8	0.4
40	4500	520	6.82	4445	6325	50	94	1.49	-1.48	1.82	11.5	0.4
40	4500	540	6.63	4492	6358	49	89	1.43	-1.42	1.76	11.2	0.4
40	4500	560	6.46	4536	6389	49	84	1.37	-1.36	1.71	10.9	0.3
40	4500	580	6.30	4577	6418	48	80	1.31	-1.31	1.66	10.6	0.3
40	4500	600	6.15	4614	6445	48	76	1.26	-1.26	1.61	10.4	0.3
40	5000	400	8.85	4429	6680	55	149	2.06	-2.03	2.24	15.0	0.5
40	5000	420	8.59	4516	6737	54	139	1.94	-1.92	2.16	14.5	0.5
40	5000	440	8.35	4595	6791	53	130	1.84	-1.82	2.08	14.1	0.5
40	5000	460	8.11	4669	6841	52	122	1.74	-1.73	2.00	13.7	0.5
40	5000	480	7.89	4738	6888	52	115	1.66	-1.64	1.94	13.3	0.4
40	5000	500	7.68	4802	6933	51	108	1.58	-1.57	1.87	13.0	0.4
40	5000	520	7.47	4861	6974	51	102	1.51	-1.50	1.81	12.6	0.4
40	5000	540	7.28	4917	7012	50	97	1.44	-1.43	1.75	12.3	0.4
40	5000	560	7.09	4968	7049	50	91	1.38	-1.37	1.70	12.0	0.4
40	5000	580	6.92	5016	7082	49	87	1.33	-1.32	1.65	11.7	0.4
40	5000	600	6.76	5059	7113	49	82	1.28	-1.27	1.61	11.4	0.4
40	5500	400	9.56	4777	7285	56	159	2.08	-2.05	2.22	16.2	0.6
40	5500	420	9.29	4874	7349	55	149	1.96	-1.94	2.14	15.7	0.6
40	5500	440	9.04	4964	7409	54	139	1.86	-1.84	2.06	15.3	0.5
40	5500	460	8.79	5048	7466	53	131	1.76	-1.75	1.99	14.9	0.5
40	5500	480	8.56	5127	7519	53	123	1.68	-1.66	1.92	14.5	0.5
40	5500	500	8.33	5199	7569	52	116	1.60	-1.58	1.86	14.1	0.5
40	5500	520	8.12	5267	7615	51	110	1.53	-1.51	1.80	13.7	0.5
40	5500	540	7.91	5331	7659	51	104	1.46	-1.45	1.75	13.4	0.5
40	5500	560	7.71	5390	7701	50	98	1.40	-1.39	1.69	13.0	0.5
40	5500	580	7.53	5444	7739	50	93	1.34	-1.33	1.64	12.7	0.5
40	5500	600	7.37	5494	7774	49	89	1.29	-1.29	1.60	12.5	0.5
40	6000	400	10.26	5113	7883	57	168	2.09	-2.07	2.20	17.3	0.6
40	6000	420	9.98	5221	7954	56	157	1.98	-1.96	2.12	16.9	0.6
40	6000	440	9.71	5322	8020	55	148	1.87	-1.86	2.05	16.4	0.6
40	6000	460	9.45	5417	8083	54	139	1.78	-1.76	1.98	16.0	0.6
40	6000	480	9.21	5504	8142	53	131	1.69	-1.68	1.91	15.6	0.6
40	6000	500	8.97	5586	8198	53	124	1.61	-1.60	1.85	15.2	0.6
40	6000	520	8.74	5663	8250	52	117	1.54	-1.53	1.79	14.8	0.6
40	6000	540	8.53	5734	8300	51	111	1.47	-1.46	1.74	14.4	0.5
40	6000	560	8.32	5801	8346	51	105	1.41	-1.40	1.69	14.1	0.5
40	6000	580	8.13	5863	8389	50	100	1.36	-1.35	1.64	13.7	0.5
40	6000	600	7.96	5919	8428	50	95	1.31	-1.30	1.60	13.5	0.6
40	6500	400	10.93	5440	8476	57	177	2.11	-2.09	2.18	18.5	0.7
40	6500	420	10.64	5559	8553	56	166	2.00	-1.97	2.10	18.0	0.7
40	6500	440	10.36	5671	8626	56	156	1.89	-1.87	2.03	17.5	0.7
40	6500	460	10.10	5775	8695	55	147	1.80	-1.78	1.96	17.1	0.7
40	6500	480	9.84	5872	8760	54	139	1.71	-1.69	1.90	16.6	0.7
40	6500	500	9.60	5964	8821	53	131	1.63	-1.61	1.84	16.2	0.6
40	6500	520	9.36	6049	8879	53	124	1.56	-1.54	1.78	15.8	0.6
40	6500	540	9.13	6129	8934	52	117	1.49	-1.48	1.73	15.4	0.6
40	6500	560	8.92	6203	8985	52	111	1.43	-1.42	1.68	15.1	0.6
40	6500	580	8.73	6272	9033	51	106	1.37	-1.36	1.63	14.7	0.6
40	6500	600	8.55	6334	9076	51	101	1.32	-1.31	1.59	14.5	0.7
40	7000	400	11.59	5757	9063	58	185	2.13	-2.10	2.16	19.6	0.8
40	7000	420	11.29	5888	9147	57	174	2.01	-1.99	2.09	19.1	0.8
40	7000	440	11.00	6010	9226	56	164	1.91	-1.89	2.02	18.6	0.8
40	7000	460	10.73	6124	9301	55	155	1.81	-1.79	1.95	18.1	0.8
40	7000	480	10.46	6231	9372	55	146	1.72	-1.71	1.89	17.7	0.7
40	7000	500	10.21	6332	9439	54	138	1.64	-1.63	1.83	17.3	0.7
40	7000	520	9.96	6426	9502	53	131	1.57	-1.56	1.77	16.8	0.7
40	7000	540	9.73	6514	9562	53	124	1.50	-1.49	1.72	16.4	0.7
40	7000	560	9.51	6597	9618	52	118	1.44	-1.43	1.67	16.1	0.7
40	7000	580	9.31	6672	9671	52	112	1.38	-1.37	1.63	15.7	0.7
40	7000	600	9.13	6741	9718	51	107	1.34	-1.33	1.59	15.4	0.8

Figure 6-68 (Sheet 16 of 20)



# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	7500	400	12.24	6066	9546	59	193	2.14	-2.12	2.14	20.7	0.9
40	7500	420	11.93	6209	9736	58	182	2.02	-2.00	2.07	20.2	0.9
40	7500	440	11.63	6341	9821	57	172	1.92	-1.90	2.00	19.7	0.8
40	7500	460	11.35	6465	9902	56	162	1.82	-1.81	1.94	19.2	0.8
40	7500	480	11.07	6582	9979	55	153	1.74	-1.72	1.88	18.7	0.8
40	7500	500	10.81	6692	10051	55	145	1.65	-1.64	1.82	18.3	0.8
40	7500	520	10.56	6795	10120	54	137	1.58	-1.57	1.76	17.8	0.8
40	7500	540	10.32	6891	10185	53	130	1.51	-1.50	1.71	17.4	0.8
40	7500	560	10.09	6981	10246	53	124	1.45	-1.44	1.66	17.1	0.8
40	7500	580	9.88	7064	10303	52	118	1.40	-1.39	1.62	16.7	0.8
40	7500	600	9.70	7139	10354	52	113	1.35	-1.34	1.58	16.4	0.9
40	8000	400	12.87	6368	10225	59	201	2.15	-2.13	2.13	21.7	1.0
40	8000	420	12.55	6520	10320	58	190	2.04	-2.02	2.05	21.2	0.9
40	8000	440	12.25	6663	10412	58	179	1.93	-1.91	1.99	20.7	0.9
40	8000	460	11.95	6793	10498	57	169	1.84	-1.82	1.92	20.2	0.9
40	8000	480	11.67	6924	10581	56	160	1.75	-1.73	1.86	19.7	0.9
40	8000	500	11.40	7043	10659	55	151	1.67	-1.65	1.81	19.3	0.9
40	8000	520	11.14	7155	10733	55	144	1.59	-1.58	1.75	18.8	0.9
40	8000	540	10.89	7260	10803	54	136	1.52	-1.51	1.70	18.4	0.9
40	8000	560	10.66	7358	10869	53	130	1.46	-1.45	1.66	18.0	0.9
40	8000	580	10.45	7448	10930	53	124	1.41	-1.40	1.62	17.7	0.9
40	8000	600	10.27	7529	10985	52	118	1.36	-1.35	1.58	17.4	1.0
40	8500	400	13.48	6662	10800	60	209	2.17	-2.14	2.11	22.8	1.0
40	8500	420	13.16	6825	10901	59	197	2.05	-2.03	2.04	22.2	1.0
40	8500	440	12.85	6979	10998	58	186	1.94	-1.92	1.97	21.7	1.0
40	8500	460	12.55	7123	11090	57	176	1.85	-1.83	1.91	21.2	1.0
40	8500	480	12.26	7260	11178	57	166	1.76	-1.74	1.85	20.7	1.0
40	8500	500	11.98	7388	11262	56	158	1.68	-1.66	1.80	20.2	1.0
40	8500	520	11.71	7508	11341	55	150	1.60	-1.59	1.75	19.8	0.9
40	8500	540	11.46	7622	11417	54	142	1.54	-1.52	1.70	19.4	0.9
40	8500	560	11.22	7728	11488	54	135	1.47	-1.46	1.65	19.0	1.0
40	8500	580	11.01	7824	11553	53	129	1.42	-1.41	1.61	18.6	1.0
40	8500	600	10.83	7911	11612	53	124	1.37	-1.36	1.58	18.3	1.1
40	9000	400	14.09	6949	11371	61	216	2.18	-2.15	2.09	23.8	1.1
40	9000	420	13.76	7123	11478	60	204	2.06	-2.04	2.03	23.2	1.1
40	9000	440	13.44	7287	11580	59	193	1.95	-1.93	1.96	22.7	1.1
40	9000	460	13.13	7442	11678	58	182	1.86	-1.84	1.90	22.2	1.1
40	9000	480	12.83	7588	11772	57	173	1.77	-1.75	1.84	21.7	1.1
40	9000	500	12.55	7725	11861	56	164	1.69	-1.67	1.79	21.2	1.0
40	9000	520	12.27	7855	11946	56	156	1.61	-1.60	1.74	20.7	1.0
40	9000	540	12.02	7976	12026	55	148	1.55	-1.53	1.69	20.3	1.0
40	9000	560	11.78	8090	12101	54	141	1.49	-1.47	1.64	19.9	1.0
40	9000	580	11.57	8193	12171	54	135	1.43	-1.42	1.61	19.5	1.1
40	9000	600	11.38	8285	12233	53	129	1.38	-1.37	1.57	19.2	1.2
40	9500	400	14.68	7230	11938	61	223	2.19	-2.16	2.08	24.8	1.2
40	9500	420	14.34	7415	12051	60	211	2.07	-2.05	2.01	24.2	1.2
40	9500	440	14.02	7589	12159	59	199	1.96	-1.94	1.95	23.7	1.2
40	9500	460	13.70	7754	12263	58	189	1.87	-1.85	1.89	23.2	1.2
40	9500	480	13.40	7909	12361	58	179	1.78	-1.76	1.83	22.6	1.1
40	9500	500	13.11	8056	12456	57	170	1.70	-1.68	1.78	22.2	1.1
40	9500	520	12.83	8194	12546	56	162	1.62	-1.61	1.73	21.7	1.1
40	9500	540	12.57	8324	12631	56	154	1.56	-1.54	1.68	21.2	1.1
40	9500	560	12.33	8445	12711	55	147	1.50	-1.48	1.64	20.8	1.1
40	9500	580	12.12	8555	12784	54	140	1.44	-1.43	1.60	20.5	1.2
40	9500	600	11.93	8653	12850	54	134	1.39	-1.38	1.57	20.2	1.3
40	10000	400	15.26	7505	12503	62	230	2.20	-2.17	2.06	25.8	1.3
40	10000	420	14.92	7701	12621	61	217	2.08	-2.06	2.00	25.2	1.3
40	10000	440	14.58	7885	12735	60	206	1.97	-1.95	1.94	24.6	1.3
40	10000	460	14.26	8060	12844	59	195	1.88	-1.86	1.88	24.1	1.2
40	10000	480	13.96	8225	12948	58	185	1.79	-1.77	1.82	23.6	1.2
40	10000	500	13.66	8380	13047	57	176	1.71	-1.69	1.77	23.1	1.2
40	10000	520	13.38	8527	13142	57	167	1.63	-1.62	1.72	22.6	1.2
40	10000	540	13.11	8665	13232	56	159	1.57	-1.55	1.67	22.2	1.2
40	10000	560	12.87	8793	13316	55	152	1.51	-1.49	1.63	21.8	1.3
40	10000	580	12.66	8919	13393	55	145	1.45	-1.44	1.60	21.4	1.3
40	10000	600	12.47	9043	13462	55	140	1.41	-1.39	1.57	21.1	1.5

Figure 6-68 (Sheet 17 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	1500	400	2.87	1351	2018	50	55	1.94	-1.93	2.41	4.9	0.1
45	1500	420	2.76	1362	2026	50	51	1.84	-1.83	2.30	4.7	0.1
45	1500	440	2.65	1372	2033	50	47	1.75	-1.74	2.20	4.5	0.1
45	1500	460	2.55	1381	2039	49	44	1.66	-1.66	2.11	4.3	0.1
45	1500	480	2.46	1389	2044	49	41	1.59	-1.58	2.03	4.2	0.1
45	1500	500	2.37	1396	2049	49	39	1.52	-1.51	1.96	4.0	0.1
45	1500	520	2.29	1402	2053	49	36	1.45	-1.45	1.89	3.9	0.1
45	1500	540	2.22	1408	2057	48	34	1.40	-1.39	1.82	3.7	0.1
45	1500	560	2.14	1414	2061	48	32	1.34	-1.34	1.76	3.6	0.1
45	1500	580	2.08	1419	2065	48	30	1.29	-1.29	1.70	3.5	0.1
45	1500	600	2.01	1423	2068	48	29	1.25	-1.24	1.65	3.4	0.0
45	2000	400	3.74	1754	2650	52	63	1.98	-1.97	2.38	6.3	0.1
45	2000	420	3.60	1772	2672	51	63	1.88	-1.87	2.28	6.1	0.1
45	2000	440	3.46	1788	2682	51	58	1.78	-1.77	2.18	5.9	0.1
45	2000	460	3.34	1802	2692	50	54	1.70	-1.69	2.10	5.6	0.1
45	2000	480	3.22	1815	2701	50	50	1.62	-1.61	2.02	5.4	0.1
45	2000	500	3.11	1827	2709	50	47	1.54	-1.54	1.94	5.3	0.1
45	2000	520	3.01	1837	2716	49	44	1.48	-1.47	1.87	5.1	0.1
45	2000	540	2.91	1847	2722	49	42	1.42	-1.41	1.81	4.9	0.1
45	2000	560	2.82	1856	2728	49	39	1.36	-1.36	1.75	4.8	0.1
45	2000	580	2.74	1864	2734	49	37	1.31	-1.31	1.69	4.6	0.1
45	2000	600	2.66	1871	2739	48	35	1.26	-1.26	1.64	4.5	0.1
45	2500	400	4.58	2139	3290	53	79	2.02	-2.01	2.35	7.7	0.2
45	2500	420	4.41	2164	3307	52	74	1.91	-1.90	2.25	7.4	0.2
45	2500	440	4.25	2187	3321	52	68	1.81	-1.80	2.16	7.2	0.2
45	2500	460	4.10	2207	3335	51	64	1.72	-1.71	2.08	6.9	0.1
45	2500	480	3.96	2226	3347	51	60	1.64	-1.63	2.00	6.7	0.1
45	2500	500	3.83	2243	3359	51	56	1.57	-1.56	1.93	6.5	0.1
45	2500	520	3.71	2258	3369	50	52	1.50	-1.49	1.86	6.3	0.1
45	2500	540	3.60	2273	3379	50	49	1.44	-1.43	1.80	6.1	0.1
45	2500	560	3.49	2286	3387	50	46	1.38	-1.38	1.74	5.9	0.1
45	2500	580	3.38	2297	3395	49	44	1.33	-1.32	1.68	5.7	0.1
45	2500	600	3.29	2308	3403	49	41	1.28	-1.28	1.63	5.6	0.1
45	3000	400	5.38	2508	3910	54	91	2.05	-2.03	2.32	9.1	0.2
45	3000	420	5.19	2541	3932	54	84	1.94	-1.93	2.23	8.8	0.2
45	3000	440	5.01	2571	3951	53	78	1.84	-1.83	2.14	8.5	0.2
45	3000	460	4.84	2598	3969	52	73	1.75	-1.74	2.06	8.2	0.2
45	3000	480	4.68	2623	3985	52	68	1.67	-1.66	1.99	7.9	0.2
45	3000	500	4.53	2646	4000	52	64	1.59	-1.58	1.92	7.7	0.2
45	3000	520	4.39	2667	4014	51	60	1.52	-1.51	1.85	7.4	0.2
45	3000	540	4.26	2686	4027	51	57	1.46	-1.45	1.79	7.2	0.2
45	3000	560	4.14	2703	4038	50	53	1.40	-1.39	1.73	7.0	0.2
45	3000	580	4.02	2720	4049	50	50	1.35	-1.34	1.68	6.8	0.2
45	3000	600	3.91	2734	4059	50	48	1.30	-1.29	1.63	6.6	0.2
45	3500	400	6.15	2862	4521	55	101	2.08	-2.06	2.30	10.4	0.3
45	3500	420	5.94	2904	4548	55	94	1.96	-1.95	2.21	10.0	0.3
45	3500	440	5.75	2942	4572	54	88	1.86	-1.85	2.12	9.7	0.3
45	3500	460	5.56	2976	4594	53	82	1.77	-1.76	2.04	9.4	0.2
45	3500	480	5.38	3008	4615	53	77	1.69	-1.68	1.97	9.1	0.2
45	3500	500	5.22	3037	4634	52	72	1.61	-1.60	1.90	8.8	0.2
45	3500	520	5.06	3063	4651	52	68	1.54	-1.53	1.84	8.6	0.2
45	3500	540	4.91	3088	4667	52	64	1.48	-1.47	1.78	8.3	0.2
45	3500	560	4.77	3111	4682	51	60	1.42	-1.41	1.72	8.1	0.2
45	3500	580	4.64	3131	4696	51	57	1.36	-1.36	1.67	7.8	0.2
45	3500	600	4.51	3150	4709	51	54	1.31	-1.31	1.62	7.6	0.2
45	4000	400	6.90	3204	5125	56	111	2.10	-2.08	2.28	11.7	0.3
45	4000	420	6.68	3254	5157	55	104	1.99	-1.97	2.19	11.3	0.3
45	4000	440	6.46	3300	5186	55	97	1.88	-1.87	2.11	10.9	0.3
45	4000	460	6.26	3342	5213	54	91	1.79	-1.78	2.03	10.6	0.3
45	4000	480	6.07	3381	5237	54	85	1.71	-1.70	1.96	10.3	0.3
45	4000	500	5.88	3417	5260	53	80	1.63	-1.62	1.89	9.9	0.3
45	4000	520	5.71	3449	5282	53	75	1.56	-1.55	1.83	9.7	0.3
45	4000	540	5.55	3479	5302	52	71	1.49	-1.48	1.77	9.4	0.3
45	4000	560	5.39	3507	5320	52	67	1.43	-1.42	1.71	9.1	0.3
45	4000	580	5.25	3533	5337	52	63	1.38	-1.37	1.66	8.9	0.3
45	4000	600	5.11	3556	5352	51	60	1.33	-1.32	1.61	8.6	0.3

**Figure 6-68 (Sheet 18 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	4500	400	7.63	3534	5722	57	121	2.12	-2.11	2.25	12.9	0.4
45	4500	420	7.39	3593	5758	56	113	2.01	-1.99	2.17	12.5	0.4
45	4500	440	7.16	3647	5792	56	105	1.90	-1.89	2.09	12.1	0.4
45	4500	460	6.94	3697	5824	55	99	1.81	-1.80	2.01	11.7	0.4
45	4500	480	6.73	3743	5853	54	93	1.72	-1.71	1.94	11.4	0.3
45	4500	500	6.54	3786	5881	54	87	1.65	-1.64	1.88	11.0	0.3
45	4500	520	6.35	3825	5906	53	82	1.57	-1.56	1.82	10.7	0.3
45	4500	540	6.17	3861	5930	53	77	1.51	-1.50	1.76	10.4	0.3
45	4500	560	6.00	3895	5951	53	73	1.45	-1.44	1.70	10.1	0.3
45	4500	580	5.85	3926	5972	52	69	1.39	-1.38	1.65	9.9	0.3
45	4500	600	5.70	3954	5990	52	65	1.34	-1.33	1.61	9.6	0.3
45	5000	400	8.34	3853	6312	58	130	2.14	-2.12	2.23	14.1	0.5
45	5000	420	8.08	3921	6354	57	121	2.03	-2.01	2.15	13.7	0.4
45	5000	440	7.83	3984	6393	56	114	1.92	-1.91	2.07	13.2	0.4
45	5000	460	7.60	4042	6430	56	107	1.83	-1.81	2.00	12.8	0.4
45	5000	480	7.38	4096	6463	55	100	1.74	-1.73	1.93	12.5	0.4
45	5000	500	7.17	4145	6495	55	94	1.66	-1.65	1.87	12.1	0.4
45	5000	520	6.97	4191	6524	54	89	1.59	-1.58	1.81	11.8	0.4
45	5000	540	6.78	4234	6552	54	84	1.52	-1.51	1.75	11.5	0.4
45	5000	560	6.60	4273	6577	53	79	1.46	-1.45	1.70	11.2	0.4
45	5000	580	6.43	4309	6601	53	75	1.40	-1.40	1.65	10.9	0.4
45	5000	600	6.28	4342	6622	52	71	1.35	-1.35	1.60	10.6	0.4
45	5500	400	9.02	4162	6898	59	139	2.16	-2.14	2.21	15.3	0.5
45	5500	420	8.75	4240	6945	58	130	2.05	-2.03	2.13	14.8	0.5
45	5500	440	8.50	4312	6989	57	121	1.94	-1.92	2.05	14.4	0.5
45	5500	460	8.25	4378	7030	57	114	1.84	-1.83	1.98	13.9	0.5
45	5500	480	8.02	4439	7068	56	107	1.76	-1.74	1.92	13.6	0.5
45	5500	500	7.80	4496	7104	55	101	1.68	-1.67	1.85	13.2	0.5
45	5500	520	7.58	4549	7137	55	95	1.60	-1.59	1.80	12.8	0.4
45	5500	540	7.38	4598	7169	54	90	1.54	-1.53	1.74	12.5	0.4
45	5500	560	7.19	4643	7198	54	85	1.47	-1.47	1.69	12.2	0.4
45	5500	580	7.01	4685	7225	53	81	1.42	-1.41	1.64	11.9	0.4
45	5500	600	6.85	4723	7250	53	77	1.37	-1.36	1.60	11.6	0.4
45	6000	400	9.69	4463	7478	59	147	2.18	-2.16	2.19	16.4	0.6
45	6000	420	9.41	4550	7530	59	138	2.06	-2.04	2.11	15.9	0.6
45	6000	440	9.14	4630	7579	58	129	1.96	-1.94	2.04	15.5	0.6
45	6000	460	8.89	4705	7625	57	121	1.86	-1.84	1.97	15.0	0.6
45	6000	480	8.64	4774	7668	57	114	1.77	-1.76	1.90	14.6	0.5
45	6000	500	8.41	4838	7708	56	108	1.69	-1.68	1.84	14.2	0.5
45	6000	520	8.18	4898	7745	55	102	1.62	-1.61	1.79	13.8	0.5
45	6000	540	7.97	4954	7781	55	96	1.55	-1.54	1.73	13.5	0.5
45	6000	560	7.77	5005	7814	54	91	1.49	-1.48	1.68	13.1	0.5
45	6000	580	7.58	5053	7844	54	86	1.43	-1.42	1.63	12.8	0.5
45	6000	600	7.42	5096	7872	54	82	1.38	-1.37	1.59	12.5	0.5
45	6500	400	10.35	4755	8054	60	155	2.19	-2.17	2.17	17.5	0.7
45	6500	420	10.06	4851	8111	59	145	2.08	-2.06	2.09	17.0	0.7
45	6500	440	9.77	4941	8165	59	136	1.97	-1.95	2.02	16.5	0.6
45	6500	460	9.51	5024	8215	58	128	1.87	-1.86	1.96	16.1	0.6
45	6500	480	9.25	5101	8262	57	121	1.78	-1.77	1.89	15.6	0.6
45	6500	500	9.01	5173	8307	57	114	1.70	-1.69	1.83	15.2	0.6
45	6500	520	8.77	5240	8349	56	108	1.63	-1.62	1.78	14.8	0.6
45	6500	540	8.55	5302	8388	55	102	1.56	-1.55	1.72	14.4	0.6
45	6500	560	8.34	5360	8425	55	97	1.50	-1.49	1.67	14.1	0.6
45	6500	580	8.15	5413	8459	55	92	1.44	-1.43	1.63	13.8	0.6
45	6500	600	7.97	5461	8490	54	87	1.39	-1.38	1.59	13.5	0.6
45	7000	400	10.99	5040	8626	61	162	2.21	-2.19	2.15	18.6	0.7
45	7000	420	10.68	5145	8688	60	152	2.09	-2.07	2.08	18.1	0.7
45	7000	440	10.39	5244	8746	59	143	1.98	-1.97	2.01	17.6	0.7
45	7000	460	10.12	5335	8801	58	135	1.89	-1.87	1.94	17.1	0.7
45	7000	480	9.85	5420	8853	58	127	1.80	-1.78	1.88	16.6	0.7
45	7000	500	9.59	5500	8902	57	120	1.72	-1.70	1.82	16.2	0.7
45	7000	520	9.35	5574	8948	57	114	1.64	-1.63	1.77	15.8	0.6
45	7000	540	9.12	5643	8991	56	108	1.57	-1.56	1.71	15.4	0.6
45	7000	560	8.90	5707	9032	56	102	1.51	-1.50	1.67	15.0	0.6
45	7000	580	8.70	5766	9069	55	97	1.45	-1.44	1.62	14.7	0.6
45	7000	600	8.53	5819	9103	55	93	1.40	-1.40	1.58	14.4	0.7

Figure 6-69 (Sheet 19 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Front Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	7500	400	11.61	5318	9194	61	169	2.22	-2.20	2.13	19.6	0.8
45	7500	420	11.30	5432	9261	61	159	2.10	-2.08	2.06	19.1	0.8
45	7500	440	11.00	5539	9324	60	150	1.99	-1.98	1.99	18.6	0.8
45	7500	460	10.71	5639	9384	59	141	1.90	-1.88	1.93	18.1	0.8
45	7500	480	10.44	5733	9440	58	134	1.81	-1.79	1.87	17.6	0.7
45	7500	500	10.17	5820	9493	58	126	1.73	-1.71	1.81	17.2	0.7
45	7500	520	9.92	5901	9543	57	119	1.65	-1.64	1.76	16.8	0.7
45	7500	540	9.68	5977	9590	57	113	1.58	-1.57	1.71	16.4	0.7
45	7500	560	9.45	6048	9635	56	107	1.52	-1.51	1.66	16.0	0.7
45	7500	580	9.25	6112	9675	56	102	1.46	-1.45	1.62	15.6	0.7
45	7500	600	9.07	6170	9712	55	98	1.42	-1.41	1.58	15.3	0.8
45	8000	400	12.23	5589	9759	62	176	2.23	-2.21	2.12	20.7	0.9
45	8000	420	11.90	5713	9830	61	166	2.11	-2.09	2.05	20.1	0.9
45	8000	440	11.59	5829	9898	60	156	2.01	-1.99	1.98	19.6	0.9
45	8000	460	11.30	5937	9962	60	148	1.91	-1.89	1.92	19.1	0.8
45	8000	480	11.01	6038	10023	59	140	1.82	-1.80	1.86	18.6	0.8
45	8000	500	10.74	6133	10081	58	132	1.74	-1.72	1.80	18.1	0.8
45	8000	520	10.48	6222	10135	58	125	1.66	-1.65	1.75	17.7	0.8
45	8000	540	10.23	6305	10186	57	119	1.59	-1.58	1.70	17.3	0.8
45	8000	560	10.00	6382	10234	57	113	1.53	-1.52	1.65	16.9	0.8
45	8000	580	9.79	6452	10278	56	107	1.47	-1.47	1.61	16.6	0.8
45	8000	600	9.61	6515	10317	56	103	1.43	-1.42	1.57	16.2	0.9
45	8500	400	12.83	5853	10320	62	183	2.24	-2.22	2.10	21.7	1.0
45	8500	420	12.49	5987	10397	62	173	2.12	-2.10	2.03	21.1	1.0
45	8500	440	12.18	6112	10469	61	163	2.02	-2.00	1.97	20.6	0.9
45	8500	460	11.87	6228	10538	60	154	1.92	-1.90	1.90	20.1	0.9
45	8500	480	11.58	6338	10603	59	145	1.83	-1.81	1.85	19.6	0.9
45	8500	500	11.30	6441	10664	59	138	1.75	-1.73	1.79	19.1	0.9
45	8500	520	11.03	6537	10723	58	130	1.67	-1.66	1.74	18.6	0.9
45	8500	540	10.78	6627	10778	58	124	1.60	-1.59	1.69	18.2	0.9
45	8500	560	10.54	6710	10829	57	118	1.54	-1.53	1.65	17.8	0.9
45	8500	580	10.33	6786	10877	57	112	1.49	-1.48	1.61	17.5	0.9
45	8500	600	10.15	6854	10919	56	107	1.44	-1.43	1.57	17.1	1.0
45	9000	400	13.41	6112	10879	63	190	2.25	-2.23	2.08	22.7	1.1
45	9000	420	13.08	6255	10960	62	179	2.13	-2.11	2.02	22.1	1.0
45	9000	440	12.75	6389	11037	61	169	2.03	-2.01	1.95	21.5	1.0
45	9000	460	12.44	6514	11110	61	160	1.93	-1.91	1.89	21.0	1.0
45	9000	480	12.14	6632	11179	60	151	1.84	-1.82	1.83	20.5	1.0
45	9000	500	11.85	6742	11245	59	143	1.76	-1.74	1.78	20.0	1.0
45	9000	520	11.57	6846	11308	59	136	1.68	-1.67	1.73	19.6	0.9
45	9000	540	11.31	6942	11366	58	129	1.61	-1.60	1.68	19.1	0.9
45	9000	560	11.08	7032	11421	58	123	1.55	-1.54	1.64	18.7	1.0
45	9000	580	10.86	7113	11472	57	117	1.49	-1.49	1.60	18.4	1.0
45	9000	600	10.67	7186	11517	57	112	1.45	-1.44	1.57	18.0	1.1
45	9500	400	13.99	6366	11436	63	196	2.26	-2.24	2.07	23.6	1.1
45	9500	420	13.65	6518	11521	63	185	2.14	-2.12	2.00	23.1	1.1
45	9500	440	13.31	6660	11602	62	175	2.04	-2.02	1.94	22.5	1.1
45	9500	460	12.99	6794	11679	61	165	1.94	-1.92	1.88	22.0	1.1
45	9500	480	12.68	6920	11753	60	156	1.85	-1.83	1.82	21.4	1.0
45	9500	500	12.39	7038	11823	60	148	1.77	-1.75	1.77	20.9	1.0
45	9500	520	12.11	7149	11889	59	141	1.69	-1.68	1.72	20.5	1.0
45	9500	540	11.85	7253	11952	59	134	1.62	-1.61	1.67	20.0	1.0
45	9500	560	11.60	7348	12010	58	128	1.56	-1.55	1.63	19.6	1.1
45	9500	580	11.39	7435	12064	58	122	1.50	-1.49	1.60	19.2	1.1
45	9500	600	11.20	7513	12112	57	117	1.46	-1.45	1.56	18.9	1.2
45	10000	400	14.56	6614	11990	64	202	2.27	-2.25	2.05	24.6	1.2
45	10000	420	14.21	6775	12079	63	191	2.15	-2.13	1.99	24.0	1.2
45	10000	440	13.87	6927	12165	62	180	2.04	-2.03	1.93	23.4	1.2
45	10000	460	13.54	7069	12246	62	171	1.95	-1.93	1.87	22.9	1.1
45	10000	480	13.22	7203	12324	61	162	1.86	-1.84	1.81	22.3	1.1
45	10000	500	12.92	7329	12398	60	154	1.77	-1.76	1.76	21.8	1.1
45	10000	520	12.64	7447	12468	60	146	1.70	-1.69	1.71	21.4	1.1
45	10000	540	12.37	7557	12534	59	139	1.63	-1.62	1.67	20.9	1.1
45	10000	560	12.13	7659	12596	59	132	1.57	-1.56	1.63	20.5	1.2
45	10000	580	11.91	7752	12653	58	127	1.51	-1.50	1.59	20.1	1.2
45	10000	600	11.72	7834	12703	58	121	1.47	-1.46	1.56	19.8	1.3

**Figure 6-69 (Sheet 20 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	200	400	3.41	2281	2290	10	90	0.23	-0.22	2.52	5.8	0.1
0	200	420	3.41	2395	2403	9	86	0.21	-0.20	2.40	5.8	0.1
0	200	440	3.41	2508	2516	9	82	0.19	-0.18	2.29	5.8	0.1
0	200	460	3.42	2621	2628	8	78	0.18	-0.17	2.20	5.8	0.1
0	200	480	3.42	2734	2741	8	75	0.16	-0.15	2.11	5.8	0.1
0	200	500	3.37	2810	2817	8	73	0.15	-0.14	2.02	5.7	0.1
0	200	520	3.30	2856	2863	8	72	0.14	-0.14	1.95	5.6	0.1
0	200	540	3.22	2899	2906	7	71	0.14	-0.13	1.87	5.4	0.1
0	200	560	3.15	2939	2945	7	70	0.13	-0.12	1.81	5.3	0.1
0	200	580	3.08	2975	2982	7	69	0.12	-0.12	1.75	5.2	0.1
0	200	600	3.01	3009	3015	7	68	0.12	-0.11	1.69	5.1	0.1
0	300	400	4.21	2808	2824	12	109	0.28	-0.27	2.52	7.1	0.1
0	300	420	4.21	2947	2962	11	104	0.25	-0.24	2.40	7.1	0.1
0	300	440	4.21	3086	3101	11	99	0.23	-0.22	2.30	7.1	0.1
0	300	460	4.21	3225	3239	10	95	0.21	-0.20	2.20	7.1	0.1
0	300	480	4.22	3364	3377	10	91	0.20	-0.19	2.11	7.1	0.1
0	300	500	4.17	3468	3481	10	88	0.18	-0.17	2.03	7.1	0.1
0	300	520	4.10	3540	3552	9	86	0.17	-0.16	1.95	6.9	0.1
0	300	540	4.02	3608	3620	9	85	0.16	-0.16	1.88	6.8	0.1
0	300	560	3.95	3672	3684	9	83	0.15	-0.15	1.81	6.7	0.1
0	300	580	3.88	3733	3745	8	82	0.15	-0.14	1.75	6.6	0.1
0	300	600	3.81	3790	3802	8	81	0.14	-0.13	1.69	6.4	0.1
0	400	400	4.89	3251	3275	14	125	0.32	-0.31	2.52	8.3	0.1
0	400	420	4.89	3412	3435	13	119	0.29	-0.28	2.40	8.3	0.1
0	400	440	4.89	3572	3595	12	113	0.27	-0.25	2.30	8.3	0.1
0	400	460	4.89	3733	3754	12	108	0.24	-0.23	2.20	8.3	0.1
0	400	480	4.89	3893	3914	11	104	0.22	-0.21	2.11	8.3	0.2
0	400	500	4.85	4021	4041	11	101	0.21	-0.20	2.03	8.2	0.2
0	400	520	4.78	4114	4134	11	98	0.20	-0.19	1.95	8.1	0.2
0	400	540	4.70	4204	4223	10	96	0.18	-0.18	1.88	7.9	0.2
0	400	560	4.63	4289	4308	10	94	0.17	-0.17	1.82	7.8	0.2
0	400	580	4.55	4371	4389	10	93	0.17	-0.16	1.75	7.7	0.2
0	400	600	4.48	4448	4466	9	91	0.16	-0.15	1.70	7.6	0.2
0	500	400	5.48	3640	3674	15	138	0.36	-0.34	2.52	9.3	0.2
0	500	420	5.48	3820	3852	15	132	0.32	-0.31	2.40	9.3	0.2
0	500	440	5.48	4000	4031	14	126	0.30	-0.28	2.30	9.3	0.2
0	500	460	5.49	4179	4209	13	121	0.27	-0.26	2.20	9.3	0.2
0	500	480	5.49	4358	4387	13	116	0.25	-0.24	2.11	9.3	0.2
0	500	500	5.45	4508	4535	12	112	0.23	-0.22	2.03	9.2	0.2
0	500	520	5.38	4620	4647	12	109	0.22	-0.21	1.95	9.1	0.2
0	500	540	5.30	4728	4754	11	107	0.20	-0.20	1.88	9.0	0.2
0	500	560	5.23	4832	4858	11	104	0.19	-0.19	1.82	8.8	0.2
0	500	580	5.15	4932	4957	11	102	0.18	-0.18	1.76	8.7	0.2
0	500	600	5.08	5028	5053	10	100	0.17	-0.17	1.70	8.6	0.2
0	600	400	6.02	3991	4036	17	151	0.39	-0.37	2.52	10.2	0.2
0	600	420	6.02	4188	4231	16	144	0.35	-0.34	2.40	10.2	0.2
0	600	440	6.02	4385	4426	15	138	0.32	-0.31	2.30	10.2	0.2
0	600	460	6.02	4581	4620	15	132	0.30	-0.28	2.20	10.2	0.2
0	600	480	6.03	4778	4815	14	126	0.27	-0.26	2.11	10.2	0.2
0	600	500	5.99	4946	4983	13	122	0.25	-0.24	2.03	10.1	0.2
0	600	520	5.92	5076	5111	13	119	0.24	-0.23	1.96	10.0	0.2
0	600	540	5.84	5201	5235	13	116	0.22	-0.21	1.89	9.9	0.2
0	600	560	5.77	5321	5355	12	114	0.21	-0.20	1.82	9.7	0.2
0	600	580	5.69	5438	5471	12	111	0.20	-0.19	1.76	9.6	0.2
0	600	600	5.62	5551	5583	11	109	0.19	-0.18	1.70	9.5	0.2
0	700	400	6.51	4313	4370	18	163	0.42	-0.40	2.52	11.0	0.2
0	700	420	6.52	4526	4580	17	155	0.38	-0.36	2.40	11.0	0.2
0	700	440	6.52	4738	4790	16	148	0.35	-0.33	2.30	11.0	0.2
0	700	460	6.52	4951	5000	16	142	0.32	-0.31	2.20	11.0	0.3
0	700	480	6.52	5162	5210	15	136	0.29	-0.28	2.12	11.0	0.3
0	700	500	6.49	5349	5395	15	131	0.27	-0.26	2.03	11.0	0.3
0	700	520	6.42	5494	5538	14	128	0.25	-0.25	1.96	10.8	0.3
0	700	540	6.34	5635	5678	14	125	0.24	-0.23	1.89	10.7	0.3
0	700	560	6.27	5771	5813	13	122	0.23	-0.22	1.82	10.6	0.3
0	700	580	6.20	5903	5945	13	119	0.21	-0.21	1.76	10.5	0.3
0	700	600	6.12	6031	6072	12	117	0.20	-0.20	1.70	10.3	0.3

Figure 6-69 (Sheet 1 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	800	400	6.98	4613	4681	19	173	0.45	-0.42	2.52	11.8	0.3
0	800	420	6.98	4840	4905	18	165	0.41	-0.39	2.40	11.8	0.3
0	800	440	6.98	5067	5130	17	158	0.37	-0.35	2.30	11.8	0.3
0	800	460	6.98	5293	5354	17	151	0.34	-0.33	2.20	11.8	0.3
0	800	480	6.99	5520	5577	16	145	0.31	-0.30	2.12	11.8	0.3
0	800	500	6.96	5723	5779	16	140	0.29	-0.28	2.04	11.8	0.3
0	800	520	6.88	5883	5937	15	136	0.27	-0.26	1.96	11.6	0.3
0	800	540	6.81	6038	6091	14	133	0.26	-0.25	1.89	11.5	0.3
0	800	560	6.74	6189	6240	14	130	0.24	-0.23	1.82	11.4	0.3
0	800	580	6.66	6336	6386	14	127	0.23	-0.22	1.76	11.3	0.3
0	800	600	6.59	6478	6527	13	124	0.21	-0.21	1.71	11.1	0.3
0	900	400	7.41	4893	4975	20	183	0.47	-0.45	2.52	12.5	0.3
0	900	420	7.41	5134	5212	19	175	0.43	-0.41	2.40	12.5	0.3
0	900	440	7.42	5375	5450	19	167	0.39	-0.37	2.30	12.5	0.3
0	900	460	7.42	5615	5687	18	160	0.36	-0.34	2.20	12.5	0.3
0	900	480	7.42	5855	5924	17	154	0.33	-0.32	2.12	12.5	0.3
0	900	500	7.40	6074	6140	16	148	0.31	-0.29	2.04	12.5	0.4
0	900	520	7.32	6247	6312	16	144	0.29	-0.28	1.96	12.4	0.4
0	900	540	7.25	6416	6479	15	140	0.27	-0.26	1.89	12.3	0.4
0	900	560	7.17	6580	6642	15	137	0.25	-0.24	1.83	12.1	0.4
0	900	580	7.10	6741	6801	14	134	0.24	-0.23	1.76	12.0	0.4
0	900	600	7.03	6896	6955	14	131	0.23	-0.22	1.71	11.9	0.4
0	1000	400	7.82	5158	5254	21	193	0.49	-0.47	2.52	13.2	0.3
0	1000	420	7.83	5412	5504	20	184	0.45	-0.43	2.40	13.2	0.3
0	1000	440	7.83	5665	5753	19	176	0.41	-0.39	2.30	13.2	0.4
0	1000	460	7.83	5918	6002	19	169	0.38	-0.36	2.20	13.2	0.4
0	1000	480	7.83	6171	6252	18	162	0.35	-0.33	2.12	13.2	0.4
0	1000	500	7.82	6405	6483	17	156	0.32	-0.31	2.04	13.2	0.4
0	1000	520	7.74	6591	6667	17	152	0.30	-0.29	1.96	13.1	0.4
0	1000	540	7.66	6773	6846	16	148	0.28	-0.27	1.89	13.0	0.4
0	1000	560	7.59	6950	7022	16	144	0.27	-0.26	1.83	12.8	0.4
0	1000	580	7.52	7123	7193	15	140	0.25	-0.24	1.77	12.7	0.4
0	1000	600	7.44	7291	7360	15	137	0.24	-0.23	1.71	12.6	0.4
0	1500	400	9.63	6315	6490	26	235	0.60	-0.57	2.51	16.3	0.5
0	1500	420	9.63	6624	6792	25	224	0.54	-0.52	2.40	16.3	0.5
0	1500	440	9.64	6933	7094	24	214	0.50	-0.48	2.30	16.3	0.5
0	1500	460	9.64	7242	7395	23	205	0.46	-0.44	2.20	16.3	0.5
0	1500	480	9.64	7550	7697	22	197	0.42	-0.41	2.12	16.3	0.6
0	1500	500	9.64	7851	7993	21	190	0.39	-0.38	2.04	16.3	0.6
0	1500	520	9.57	8093	8231	20	184	0.37	-0.35	1.96	16.2	0.6
0	1500	540	9.49	8331	8465	20	179	0.34	-0.33	1.90	16.0	0.6
0	1500	560	9.42	8564	8694	19	174	0.32	-0.31	1.83	15.9	0.6
0	1500	580	9.35	8792	8919	19	170	0.30	-0.29	1.77	15.8	0.6
0	1500	600	9.28	9015	9139	18	166	0.29	-0.28	1.72	15.7	0.7
0	2000	400	11.15	7284	7554	29	269	0.68	-0.65	2.49	18.8	0.6
0	2000	420	11.16	7640	7898	28	257	0.62	-0.59	2.39	18.9	0.7
0	2000	440	11.16	7996	8242	27	246	0.57	-0.55	2.29	18.9	0.7
0	2000	460	11.17	8350	8587	26	236	0.53	-0.50	2.20	18.9	0.7
0	2000	480	11.18	8704	8931	25	227	0.49	-0.47	2.11	18.9	0.8
0	2000	500	11.18	9057	9275	24	218	0.45	-0.43	2.04	18.9	0.8
0	2000	520	11.12	9352	9563	23	212	0.42	-0.40	1.96	18.8	0.8
0	2000	540	11.04	9636	9842	23	205	0.39	-0.38	1.90	18.7	0.8
0	2000	560	10.97	9916	10116	22	200	0.37	-0.36	1.83	18.5	0.8
0	2000	580	10.90	10191	10386	21	195	0.35	-0.34	1.77	18.4	0.9
0	2000	600	10.83	10460	10649	21	190	0.33	-0.32	1.72	18.3	0.9
0	2500	400	12.50	8134	8510	32	299	0.75	-0.72	2.48	21.1	0.8
0	2500	420	12.51	8531	8890	31	286	0.69	-0.66	2.38	21.1	0.8
0	2500	440	12.52	8927	9271	30	274	0.63	-0.60	2.28	21.2	0.9
0	2500	460	12.52	9322	9651	29	263	0.58	-0.56	2.19	21.2	0.9
0	2500	480	12.53	9716	10033	28	253	0.54	-0.52	2.11	21.2	0.9
0	2500	500	12.54	10109	10414	27	243	0.50	-0.48	2.03	21.2	1.0
0	2500	520	12.49	10456	10751	26	236	0.47	-0.45	1.96	21.1	1.0
0	2500	540	12.42	10781	11067	25	229	0.44	-0.42	1.90	21.0	1.0
0	2500	560	12.35	11102	11380	24	222	0.41	-0.40	1.83	20.9	1.0
0	2500	580	12.28	11418	11688	24	216	0.39	-0.37	1.78	20.7	1.1
0	2500	600	12.21	11726	11989	23	211	0.37	-0.35	1.72	20.6	1.1

Figure 6-69 (Sheet 2 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	200	400	1.40	924	945	14	44	0.60	-0.59	2.50	2.4	0.0
10	200	420	1.35	937	958	14	41	0.56	-0.55	2.38	2.3	0.0
10	200	440	1.30	949	970	13	38	0.53	-0.52	2.27	2.2	0.0
10	200	460	1.26	960	980	13	36	0.49	-0.49	2.17	2.1	0.0
10	200	480	1.22	970	990	13	34	0.47	-0.46	2.08	2.1	0.0
10	200	500	1.17	971	992	13	34	0.45	-0.44	2.00	2.0	0.0
10	200	520	1.12	967	987	13	35	0.43	-0.42	1.92	1.9	0.0
10	200	540	1.08	962	983	13	36	0.41	-0.41	1.85	1.8	0.0
10	200	560	1.04	958	978	13	37	0.40	-0.39	1.79	1.8	0.0
10	200	580	1.00	953	974	13	37	0.38	-0.38	1.73	1.7	0.0
10	200	600	0.96	949	970	13	38	0.37	-0.37	1.67	1.6	0.0
10	300	400	1.97	1302	1336	16	56	0.65	-0.64	2.49	3.3	0.0
10	300	420	1.91	1325	1358	15	52	0.60	-0.59	2.38	3.2	0.0
10	300	440	1.85	1346	1379	15	49	0.57	-0.56	2.27	3.1	0.0
10	300	460	1.80	1365	1398	14	46	0.53	-0.52	2.17	3.0	0.0
10	300	480	1.75	1383	1416	14	43	0.50	-0.49	2.08	3.0	0.0
10	300	500	1.69	1390	1422	14	42	0.48	-0.47	2.00	2.8	0.0
10	300	520	1.62	1388	1420	14	42	0.45	-0.45	1.93	2.7	0.0
10	300	540	1.56	1386	1418	14	42	0.44	-0.43	1.85	2.6	0.0
10	300	560	1.50	1383	1416	14	43	0.42	-0.41	1.79	2.5	0.0
10	300	580	1.44	1381	1413	14	43	0.40	-0.40	1.73	2.4	0.0
10	300	600	1.39	1378	1410	14	44	0.39	-0.38	1.67	2.4	0.0
10	400	400	2.49	1645	1693	17	67	0.69	-0.68	2.49	4.2	0.0
10	400	420	2.42	1678	1725	16	63	0.64	-0.63	2.37	4.1	0.0
10	400	440	2.36	1709	1755	16	59	0.60	-0.59	2.27	4.0	0.0
10	400	460	2.29	1738	1783	16	55	0.56	-0.55	2.17	3.9	0.0
10	400	480	2.23	1764	1809	15	51	0.53	-0.52	2.08	3.8	0.0
10	400	500	2.16	1779	1823	15	50	0.50	-0.49	2.00	3.6	0.0
10	400	520	2.08	1781	1825	15	49	0.48	-0.47	1.93	3.5	0.0
10	400	540	2.01	1782	1826	15	49	0.46	-0.45	1.85	3.4	0.0
10	400	560	1.94	1783	1827	14	49	0.44	-0.43	1.79	3.3	0.0
10	400	580	1.87	1783	1827	14	49	0.42	-0.42	1.73	3.2	0.0
10	400	600	1.81	1782	1827	14	49	0.41	-0.40	1.67	3.1	0.0
10	500	400	2.98	1961	2024	18	78	0.73	-0.71	2.49	5.0	0.1
10	500	420	2.90	2005	2066	18	73	0.68	-0.66	2.37	4.9	0.1
10	500	440	2.83	2045	2106	17	68	0.63	-0.62	2.27	4.8	0.1
10	500	460	2.75	2084	2143	17	64	0.59	-0.58	2.17	4.7	0.1
10	500	480	2.68	2119	2178	16	60	0.56	-0.55	2.08	4.5	0.1
10	500	500	2.60	2142	2199	16	57	0.53	-0.52	2.00	4.4	0.1
10	500	520	2.51	2149	2206	16	57	0.50	-0.49	1.93	4.2	0.1
10	500	540	2.43	2155	2212	15	56	0.48	-0.47	1.86	4.1	0.1
10	500	560	2.35	2160	2217	15	55	0.46	-0.45	1.79	4.0	0.1
10	500	580	2.27	2164	2221	15	55	0.44	-0.43	1.73	3.8	0.1
10	500	600	2.20	2167	2224	15	55	0.42	-0.42	1.67	3.7	0.1
10	600	400	3.43	2256	2334	19	88	0.76	-0.74	2.48	5.8	0.1
10	600	420	3.35	2310	2386	19	82	0.71	-0.69	2.37	5.7	0.1
10	600	440	3.27	2360	2435	18	77	0.66	-0.65	2.27	5.5	0.1
10	600	460	3.19	2408	2482	18	72	0.62	-0.61	2.17	5.4	0.1
10	600	480	3.11	2453	2525	17	68	0.58	-0.57	2.08	5.3	0.1
10	600	500	3.03	2484	2555	17	65	0.55	-0.54	2.00	5.1	0.1
10	600	520	2.93	2497	2568	16	63	0.52	-0.51	1.93	4.9	0.1
10	600	540	2.83	2508	2579	16	62	0.50	-0.49	1.86	4.8	0.1
10	600	560	2.74	2518	2589	16	62	0.47	-0.47	1.79	4.6	0.1
10	600	580	2.66	2527	2597	16	61	0.45	-0.45	1.73	4.5	0.1
10	600	600	2.58	2534	2604	16	60	0.44	-0.43	1.67	4.4	0.1
10	700	400	3.86	2532	2627	20	98	0.79	-0.77	2.48	6.5	0.1
10	700	420	3.77	2597	2689	20	91	0.73	-0.72	2.37	6.4	0.1
10	700	440	3.68	2657	2748	19	85	0.68	-0.67	2.26	6.2	0.1
10	700	460	3.60	2714	2803	19	80	0.64	-0.63	2.17	6.1	0.1
10	700	480	3.52	2768	2856	18	75	0.60	-0.59	2.08	5.9	0.1
10	700	500	3.43	2808	2894	18	72	0.57	-0.56	2.00	5.8	0.1
10	700	520	3.32	2828	2913	17	70	0.54	-0.53	1.93	5.6	0.1
10	700	540	3.22	2845	2930	17	69	0.51	-0.51	1.86	5.4	0.1
10	700	560	3.12	2860	2945	17	67	0.49	-0.48	1.79	5.3	0.1
10	700	580	3.03	2874	2958	16	66	0.47	-0.46	1.73	5.1	0.1
10	700	600	2.94	2885	2969	16	65	0.45	-0.44	1.67	5.0	0.1

Figure 6-69 (Sheet 3 of 20)

# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	900	400	5.76	2392	2556	34	188	1.60	-1.51	3.81	9.7	3.7
10	900	420	5.71	2453	2613	33	180	1.51	-1.43	3.69	9.6	3.7
10	900	440	5.66	2511	2668	32	172	1.44	-1.36	3.59	9.6	3.8
10	900	460	5.62	2567	2720	32	165	1.37	-1.30	3.49	9.5	3.8
10	900	480	5.58	2620	2770	31	159	1.31	-1.24	3.40	9.4	3.9
10	900	500	5.54	2671	2818	30	153	1.25	-1.19	3.32	9.4	3.9
10	900	520	5.49	2719	2864	30	148	1.20	-1.14	3.24	9.3	4.0
10	900	540	5.46	2765	2908	29	142	1.16	-1.10	3.17	9.2	4.0
10	900	560	5.42	2810	2950	29	138	1.12	-1.06	3.10	9.2	4.1
10	900	580	5.38	2852	2991	29	133	1.08	-1.03	3.04	9.1	4.1
10	900	600	5.34	2893	3030	28	129	1.04	-0.99	2.98	9.0	4.1
10	1000	400	6.29	2533	2724	35	204	1.70	-1.60	3.90	10.6	4.2
10	1000	420	6.24	2599	2785	35	196	1.61	-1.52	3.79	10.5	4.3
10	1000	440	6.20	2661	2843	35	188	1.54	-1.45	3.68	10.5	4.3
10	1000	460	6.15	2721	2899	34	180	1.47	-1.39	3.59	10.4	4.4
10	1000	480	6.11	2777	2952	33	174	1.40	-1.33	3.50	10.3	4.5
10	1000	500	6.07	2831	3003	33	167	1.34	-1.27	3.42	10.3	4.5
10	1000	520	6.03	2883	3052	32	162	1.29	-1.22	3.34	10.2	4.6
10	1000	540	6.00	2933	3098	32	156	1.24	-1.18	3.27	10.1	4.6
10	1000	560	5.96	2980	3143	31	151	1.20	-1.14	3.20	10.1	4.7
10	1000	580	5.93	3026	3187	31	147	1.16	-1.10	3.14	10.0	4.7
10	1000	600	5.89	3069	3228	30	143	1.12	-1.07	3.08	10.0	4.8
10	1100	400	6.80	2664	2832	39	220	1.80	-1.70	3.98	11.5	4.7
10	1100	420	6.75	2733	2946	38	211	1.71	-1.61	3.87	11.4	4.8
10	1100	440	6.71	2799	3007	37	203	1.63	-1.54	3.77	11.3	4.9
10	1100	460	6.67	2861	3066	36	195	1.56	-1.47	3.68	11.3	5.0
10	1100	480	6.63	2921	3122	35	188	1.49	-1.41	3.59	11.2	5.0
10	1100	500	6.59	2979	3175	35	182	1.43	-1.36	3.51	11.1	5.1
10	1100	520	6.56	3033	3227	35	176	1.38	-1.30	3.43	11.1	5.2
10	1100	540	6.52	3086	3276	34	170	1.33	-1.26	3.36	11.0	5.2
10	1100	560	6.49	3135	3323	34	165	1.28	-1.22	3.30	11.0	5.3
10	1100	580	6.45	3184	3369	33	160	1.24	-1.18	3.24	10.9	5.3
10	1100	600	6.42	3231	3413	33	156	1.20	-1.14	3.18	10.9	5.4
10	1200	400	7.29	2784	3032	41	235	1.90	-1.79	4.06	12.3	5.3
10	1200	420	7.25	2857	3098	40	226	1.81	-1.70	3.95	12.3	5.3
10	1200	440	7.21	2926	3162	39	217	1.73	-1.62	3.85	12.2	5.4
10	1200	460	7.17	2991	3223	39	209	1.65	-1.56	3.76	12.1	5.5
10	1200	480	7.14	3054	3281	38	202	1.58	-1.49	3.68	12.1	5.6
10	1200	500	7.10	3114	3337	37	196	1.52	-1.44	3.60	12.0	5.7
10	1200	520	7.07	3172	3391	37	189	1.46	-1.38	3.52	11.9	5.7
10	1200	540	7.03	3227	3443	36	184	1.41	-1.34	3.45	11.9	5.8
10	1200	560	7.00	3279	3492	36	179	1.36	-1.29	3.39	11.8	5.9
10	1200	580	6.97	3330	3540	36	173	1.32	-1.25	3.33	11.8	5.9
10	1200	600	6.94	3379	3585	35	169	1.28	-1.21	3.27	11.7	6.0
10	1300	400	7.78	2896	3174	43	250	2.00	-1.88	4.14	13.1	5.8
10	1300	420	7.74	2971	3243	42	240	1.91	-1.79	4.03	13.1	5.9
10	1300	440	7.70	3043	3309	41	232	1.82	-1.71	3.93	13.0	6.0
10	1300	460	7.66	3112	3372	41	224	1.74	-1.64	3.84	13.0	6.1
10	1300	480	7.63	3177	3433	40	216	1.67	-1.57	3.76	12.9	6.2
10	1300	500	7.60	3240	3491	40	209	1.61	-1.51	3.68	12.8	6.3
10	1300	520	7.56	3300	3547	39	203	1.55	-1.46	3.60	12.8	6.3
10	1300	540	7.53	3357	3600	39	197	1.49	-1.41	3.53	12.7	6.4
10	1300	560	7.50	3412	3651	38	192	1.45	-1.37	3.47	12.7	6.5
10	1300	580	7.47	3465	3701	38	186	1.40	-1.32	3.41	12.6	6.6
10	1300	600	7.44	3515	3748	37	182	1.36	-1.28	3.35	12.6	6.6
10	1400	400	8.25	3000	3311	45	265	2.10	-1.96	4.21	13.9	6.3
10	1400	420	8.21	3079	3382	44	255	2.00	-1.87	4.10	13.9	6.4
10	1400	440	8.17	3153	3450	44	246	1.91	-1.79	4.00	13.8	6.5
10	1400	460	8.14	3224	3515	43	238	1.83	-1.72	3.91	13.8	6.6
10	1400	480	8.11	3292	3577	42	230	1.76	-1.65	3.83	13.7	6.7
10	1400	500	8.08	3357	3637	42	223	1.69	-1.59	3.75	13.6	6.8
10	1400	520	8.04	3419	3694	41	216	1.63	-1.54	3.68	13.6	6.9
10	1400	540	8.01	3478	3749	41	210	1.58	-1.49	3.61	13.5	7.0
10	1400	560	7.99	3535	3802	40	205	1.52	-1.44	3.55	13.5	7.1
10	1400	580	7.96	3590	3853	40	199	1.48	-1.40	3.49	13.4	7.2
10	1400	600	7.93	3642	3902	39	194	1.43	-1.36	3.43	13.4	7.2

Figure 6-66 (Sheet 8 of 21)



# Ballistic Table — BDU-33 High Drag Bomb

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	1500	400	8.71	3093	3442	47	279	2.19	-2.05	4.27	14.7	6.8
10	1500	420	8.67	3179	3515	46	269	2.09	-1.96	4.17	14.7	7.0
10	1500	440	8.64	3255	3584	45	260	2.00	-1.87	4.07	14.6	7.1
10	1500	460	8.61	3323	3651	45	251	1.92	-1.80	3.98	14.5	7.2
10	1500	480	8.58	3393	3715	44	243	1.84	-1.73	3.90	14.5	7.3
10	1500	500	8.55	3466	3776	44	236	1.77	-1.67	3.82	14.4	7.4
10	1500	520	8.52	3530	3835	43	229	1.71	-1.61	3.75	14.4	7.5
10	1500	540	8.49	3591	3892	43	223	1.66	-1.56	3.69	14.3	7.6
10	1500	560	8.46	3650	3946	42	217	1.60	-1.51	3.62	14.3	7.7
10	1500	580	8.43	3706	3998	42	212	1.55	-1.47	3.56	14.3	7.8
10	1500	600	8.41	3760	4049	42	207	1.51	-1.42	3.51	14.2	7.8
10	1600	400	9.15	3190	3569	49	293	2.28	-2.13	4.33	15.5	7.4
10	1600	420	9.12	3273	3643	48	283	2.18	-2.04	4.23	15.4	7.5
10	1600	440	9.09	3352	3714	47	273	2.08	-1.95	4.14	15.4	7.6
10	1600	460	9.06	3427	3782	47	265	2.00	-1.88	4.05	15.3	7.7
10	1600	480	9.03	3499	3848	46	257	1.92	-1.81	3.97	15.3	7.9
10	1600	500	9.00	3568	3910	46	249	1.86	-1.74	3.89	15.2	8.0
10	1600	520	8.98	3634	3970	45	242	1.79	-1.68	3.82	15.2	8.1
10	1600	540	8.95	3697	4028	45	236	1.73	-1.63	3.75	15.1	8.2
10	1600	560	8.92	3757	4084	44	230	1.68	-1.58	3.69	15.1	8.3
10	1600	580	8.90	3815	4137	44	225	1.63	-1.54	3.63	15.0	8.4
10	1600	600	8.87	3871	4189	44	219	1.58	-1.49	3.58	15.0	8.4
10	1700	400	9.59	3276	3691	50	307	2.37	-2.21	4.39	16.2	7.9
10	1700	420	9.56	3361	3767	50	296	2.26	-2.11	4.29	16.2	8.0
10	1700	440	9.54	3442	3839	49	287	2.17	-2.03	4.20	16.1	8.2
10	1700	460	9.51	3520	3909	49	278	2.08	-1.95	4.11	16.1	8.3
10	1700	480	9.48	3594	3975	48	270	2.01	-1.89	4.03	16.0	8.4
10	1700	500	9.45	3664	4039	48	262	1.93	-1.82	3.95	16.0	8.5
10	1700	520	9.43	3732	4101	47	255	1.87	-1.76	3.88	15.9	8.6
10	1700	540	9.40	3796	4159	47	249	1.81	-1.70	3.82	15.9	8.7
10	1700	560	9.38	3858	4216	46	242	1.76	-1.65	3.76	15.8	8.8
10	1700	580	9.35	3918	4271	46	237	1.70	-1.60	3.70	15.8	8.9
10	1700	600	9.33	3975	4323	45	232	1.66	-1.56	3.65	15.8	9.0
10	1800	400	10.03	3358	3810	52	320	2.45	-2.29	4.45	16.9	8.4
10	1800	420	10.00	3445	3887	51	309	2.35	-2.19	4.35	16.9	8.6
10	1800	440	9.97	3528	3961	51	300	2.25	-2.10	4.25	16.8	8.7
10	1800	460	9.94	3607	4031	50	291	2.16	-2.03	4.17	16.8	8.8
10	1800	480	9.92	3683	4099	50	282	2.09	-1.95	4.09	16.8	9.0
10	1800	500	9.89	3755	4164	49	275	2.01	-1.89	4.01	16.7	9.1
10	1800	520	9.87	3824	4226	49	268	1.95	-1.83	3.95	16.7	9.2
10	1800	540	9.84	3890	4286	48	261	1.89	-1.77	3.88	16.6	9.3
10	1800	560	9.82	3953	4344	48	255	1.83	-1.72	3.82	16.6	9.4
10	1800	580	9.80	4014	4399	48	249	1.78	-1.67	3.76	16.6	9.5
10	1800	600	9.78	4072	4452	47	244	1.73	-1.63	3.71	16.5	9.6
10	1900	400	10.45	3435	3926	54	333	2.54	-2.37	4.50	17.7	8.9
10	1900	420	10.42	3524	4004	53	322	2.43	-2.27	4.40	17.6	9.1
10	1900	440	10.40	3609	4079	52	312	2.33	-2.18	4.31	17.6	9.2
10	1900	460	10.37	3690	4150	52	303	2.24	-2.10	4.22	17.5	9.4
10	1900	480	10.35	3767	4219	51	295	2.16	-2.02	4.14	17.5	9.5
10	1900	500	10.32	3841	4285	51	287	2.09	-1.96	4.07	17.4	9.6
10	1900	520	10.30	3911	4348	51	280	2.02	-1.90	4.00	17.4	9.8
10	1900	540	10.28	3978	4409	50	273	1.96	-1.84	3.94	17.4	9.9
10	1900	560	10.26	4043	4467	50	267	1.90	-1.79	3.88	17.3	10.0
10	1900	580	10.24	4105	4523	49	261	1.85	-1.74	3.82	17.3	10.1
10	1900	600	10.21	4165	4578	49	255	1.80	-1.69	3.77	17.3	10.2
10	2000	400	10.87	3509	4039	55	346	2.62	-2.44	4.55	18.4	9.5
10	2000	420	10.84	3600	4118	55	335	2.51	-2.34	4.45	18.3	9.6
10	2000	440	10.82	3686	4194	54	325	2.41	-2.25	4.36	18.3	9.8
10	2000	460	10.79	3768	4266	53	316	2.32	-2.17	4.28	18.2	9.9
10	2000	480	10.77	3847	4336	53	307	2.24	-2.09	4.20	18.2	10.1
10	2000	500	10.75	3922	4402	53	299	2.17	-2.03	4.13	18.2	10.2
10	2000	520	10.73	3994	4466	52	292	2.10	-1.96	4.06	18.1	10.3
10	2000	540	10.71	4062	4528	52	285	2.03	-1.91	4.00	18.1	10.5
10	2000	560	10.68	4128	4587	51	279	1.98	-1.85	3.94	18.1	10.6
10	2000	580	10.66	4191	4644	51	273	1.92	-1.80	3.88	18.0	10.7
10	2000	600	10.64	4252	4699	51	267	1.87	-1.76	3.83	18.0	10.8

Figure 6-66 (Sheet 9 of 21)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	800	400	4.26	2794	2907	21	107	0.82	-0.80	2.48	7.2	0.1
10	800	420	4.17	2865	2978	21	100	0.76	-0.74	2.36	7.0	0.1
10	800	440	4.08	2939	3046	20	93	0.71	-0.69	2.26	6.9	0.1
10	800	460	3.99	3005	3110	19	88	0.66	-0.65	2.17	6.7	0.1
10	800	480	3.90	3068	3171	19	82	0.62	-0.61	2.08	6.6	0.1
10	800	500	3.81	3117	3218	18	79	0.59	-0.58	2.00	6.4	0.1
10	800	520	3.70	3143	3244	18	76	0.56	-0.55	1.92	6.2	0.1
10	800	540	3.59	3167	3266	18	75	0.53	-0.52	1.86	6.1	0.1
10	800	560	3.48	3188	3286	17	73	0.50	-0.50	1.79	5.9	0.1
10	800	580	3.38	3206	3305	17	72	0.48	-0.48	1.73	5.7	0.1
10	800	600	3.29	3223	3321	17	71	0.46	-0.46	1.67	5.6	0.1
10	900	400	4.65	3044	3174	22	115	0.84	-0.82	2.47	7.9	0.1
10	900	420	4.55	3128	3254	22	108	0.78	-0.76	2.36	7.7	0.1
10	900	440	4.46	3207	3331	21	101	0.73	-0.71	2.26	7.5	0.1
10	900	460	4.36	3283	3404	20	95	0.68	-0.67	2.17	7.4	0.1
10	900	480	4.27	3355	3474	20	89	0.64	-0.63	2.08	7.2	0.1
10	900	500	4.18	3413	3530	19	85	0.60	-0.59	2.00	7.1	0.1
10	900	520	4.06	3446	3561	19	83	0.57	-0.56	1.92	6.9	0.1
10	900	540	3.94	3475	3590	18	81	0.54	-0.53	1.86	6.7	0.1
10	900	560	3.83	3502	3616	18	79	0.52	-0.51	1.79	6.5	0.1
10	900	580	3.73	3527	3640	18	77	0.50	-0.49	1.73	6.3	0.1
10	900	600	3.63	3548	3661	17	75	0.47	-0.47	1.67	6.1	0.1
10	1000	400	5.02	3282	3431	23	123	0.87	-0.84	2.47	8.5	0.1
10	1000	420	4.92	3375	3520	22	115	0.80	-0.79	2.36	8.3	0.1
10	1000	440	4.82	3464	3606	22	108	0.75	-0.73	2.26	8.1	0.1
10	1000	460	4.72	3549	3687	21	102	0.70	-0.69	2.16	8.0	0.1
10	1000	480	4.63	3630	3765	20	96	0.66	-0.64	2.08	7.8	0.1
10	1000	500	4.53	3697	3830	20	91	0.62	-0.61	2.00	7.7	0.1
10	1000	520	4.40	3736	3868	19	89	0.59	-0.58	1.92	7.4	0.1
10	1000	540	4.29	3773	3903	19	86	0.56	-0.55	1.86	7.2	0.1
10	1000	560	4.17	3806	3935	19	84	0.53	-0.52	1.79	7.0	0.1
10	1000	580	4.06	3836	3964	18	82	0.51	-0.50	1.73	6.9	0.1
10	1000	600	3.96	3863	3990	18	80	0.49	-0.48	1.68	6.7	0.1
10	1500	400	6.67	4344	4595	27	160	0.97	-0.94	2.45	11.3	0.3
10	1500	420	6.56	4482	4726	26	150	0.90	-0.87	2.35	11.1	0.3
10	1500	440	6.45	4614	4852	25	141	0.84	-0.82	2.25	10.9	0.3
10	1500	460	6.35	4741	4973	24	133	0.78	-0.76	2.16	10.7	0.3
10	1500	480	6.24	4864	5090	24	126	0.73	-0.72	2.07	10.5	0.3
10	1500	500	6.13	4977	5198	23	119	0.69	-0.67	1.99	10.4	0.3
10	1500	520	5.99	5051	5269	22	115	0.65	-0.64	1.92	10.1	0.3
10	1500	540	5.85	5120	5335	22	112	0.62	-0.61	1.85	9.9	0.3
10	1500	560	5.72	5184	5397	21	108	0.59	-0.58	1.79	9.7	0.3
10	1500	580	5.59	5244	5455	21	105	0.56	-0.55	1.73	9.4	0.3
10	1500	600	5.46	5300	5508	21	102	0.54	-0.53	1.68	9.2	0.3
10	2000	400	8.11	5255	5623	30	191	1.05	-1.02	2.44	13.7	0.4
10	2000	420	7.99	5433	5790	29	180	0.97	-0.95	2.33	13.5	0.4
10	2000	440	7.87	5605	5951	28	170	0.91	-0.88	2.24	13.3	0.4
10	2000	460	7.76	5771	6107	27	160	0.85	-0.83	2.15	13.1	0.4
10	2000	480	7.65	5930	6259	27	152	0.79	-0.78	2.06	12.9	0.4
10	2000	500	7.54	6085	6405	26	144	0.75	-0.73	1.99	12.7	0.4
10	2000	520	7.39	6195	6510	25	139	0.71	-0.69	1.92	12.5	0.4
10	2000	540	7.24	6297	6607	24	134	0.67	-0.66	1.85	12.2	0.4
10	2000	560	7.09	6392	6698	24	130	0.64	-0.62	1.79	12.0	0.4
10	2000	580	6.95	6482	6784	23	126	0.61	-0.59	1.73	11.7	0.4
10	2000	600	6.81	6566	6864	23	122	0.58	-0.57	1.68	11.5	0.4
10	2500	400	9.40	6065	6560	33	218	1.11	-1.08	2.42	15.9	0.5
10	2500	420	9.27	6279	6759	32	206	1.03	-1.01	2.32	15.7	0.5
10	2500	440	9.15	6487	6952	31	194	0.96	-0.94	2.22	15.5	0.5
10	2500	460	9.03	6688	7140	30	184	0.90	-0.88	2.14	15.3	0.5
10	2500	480	8.91	6882	7322	29	175	0.85	-0.83	2.06	15.1	0.5
10	2500	500	8.80	7071	7500	28	166	0.80	-0.78	1.98	14.9	0.5
10	2500	520	8.65	7221	7642	27	160	0.75	-0.73	1.91	14.6	0.5
10	2500	540	8.49	7353	7767	27	154	0.71	-0.70	1.85	14.3	0.5
10	2500	560	8.33	7479	7885	26	149	0.68	-0.66	1.79	14.1	0.5
10	2500	580	8.18	7598	7999	25	144	0.64	-0.63	1.73	13.8	0.5
10	2500	600	8.04	7709	8104	25	140	0.61	-0.60	1.68	13.6	0.5

Figure 6-69 (Sheet 4 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	3000	400	10.57	6601	7433	35	242	1.17	-1.14	2.40	17.9	0.6
10	3000	420	10.44	7049	7660	34	229	1.09	-1.06	2.30	17.6	0.6
10	3000	440	10.32	7289	7832	33	217	1.01	-0.99	2.21	17.4	0.6
10	3000	460	10.20	7522	8098	32	206	0.95	-0.93	2.13	17.2	0.6
10	3000	480	10.08	7749	8309	31	196	0.89	-0.87	2.05	17.0	0.6
10	3000	500	9.96	7969	8515	30	186	0.84	-0.82	1.98	16.8	0.6
10	3000	520	9.81	8159	8693	29	179	0.79	-0.77	1.91	16.6	0.6
10	3000	540	9.65	8320	8844	29	172	0.75	-0.73	1.84	16.3	0.7
10	3000	560	9.48	8474	8939	28	167	0.71	-0.70	1.78	16.0	0.7
10	3000	580	9.33	8621	9128	27	161	0.68	-0.66	1.73	15.8	0.7
10	3000	600	9.18	8758	9258	27	156	0.65	-0.63	1.67	15.5	0.7
10	3500	400	11.66	7479	8257	36	264	1.22	-1.18	2.39	19.7	0.7
10	3500	420	11.53	7757	8510	36	250	1.13	-1.10	2.29	19.5	0.7
10	3500	440	11.40	8028	8758	35	238	1.06	-1.03	2.20	19.3	0.7
10	3500	460	11.28	8292	9001	34	226	0.99	-0.97	2.12	19.1	0.8
10	3500	480	11.15	8549	9238	33	215	0.93	-0.91	2.04	18.9	0.8
10	3500	500	11.03	8799	9470	32	205	0.88	-0.85	1.97	18.6	0.8
10	3500	520	10.89	9026	9681	31	196	0.83	-0.81	1.90	18.4	0.8
10	3500	540	10.72	9215	9858	30	189	0.78	-0.77	1.84	18.1	0.8
10	3500	560	10.56	9397	10027	30	183	0.74	-0.73	1.78	17.8	0.8
10	3500	580	10.39	9571	10191	29	177	0.71	-0.69	1.72	17.6	0.8
10	3500	600	10.24	9732	10343	28	171	0.68	-0.66	1.67	17.3	0.8
10	4000	400	12.68	8111	9044	39	285	1.26	-1.23	2.37	21.4	0.8
10	4000	420	12.55	8418	9320	38	270	1.18	-1.14	2.28	21.2	0.9
10	4000	440	12.42	8718	9592	37	257	1.10	-1.07	2.19	21.0	0.9
10	4000	460	12.29	9011	9859	36	244	1.03	-1.00	2.11	20.8	0.9
10	4000	480	12.17	9296	10120	35	233	0.97	-0.94	2.03	20.6	0.9
10	4000	500	12.04	9574	10376	34	222	0.91	-0.89	1.96	20.4	0.9
10	4000	520	11.91	9838	10620	33	212	0.86	-0.84	1.90	20.1	0.9
10	4000	540	11.74	10053	10820	32	205	0.81	-0.80	1.83	19.8	0.9
10	4000	560	11.57	10260	11013	31	198	0.77	-0.76	1.78	19.6	0.9
10	4000	580	11.40	10460	11199	31	191	0.73	-0.72	1.72	19.3	1.0
10	4000	600	11.25	10645	11372	30	186	0.70	-0.69	1.67	19.0	1.0
10	4500	400	13.64	8705	9799	41	304	1.30	-1.26	2.35	23.1	1.0
10	4500	420	13.51	9040	10098	40	288	1.21	-1.18	2.26	22.8	1.0
10	4500	440	13.38	9367	10392	39	274	1.13	-1.10	2.18	22.6	1.0
10	4500	460	13.25	9686	10680	37	261	1.06	-1.03	2.10	22.4	1.0
10	4500	480	13.13	9998	10964	36	249	1.00	-0.97	2.02	22.2	1.0
10	4500	500	13.00	10303	11242	35	238	0.94	-0.92	1.95	22.0	1.0
10	4500	520	12.88	10600	11516	34	228	0.89	-0.87	1.89	21.8	1.1
10	4500	540	12.70	10843	11740	34	220	0.84	-0.82	1.83	21.5	1.1
10	4500	560	12.53	11075	11955	33	212	0.80	-0.78	1.77	21.2	1.1
10	4500	580	12.36	11300	12163	32	205	0.76	-0.74	1.72	20.9	1.1
10	4500	600	12.20	11507	12355	31	199	0.73	-0.71	1.67	20.6	1.2
10	5000	400	14.56	9266	10529	43	321	1.34	-1.30	2.34	24.6	1.1
10	5000	420	14.43	9627	10843	41	305	1.25	-1.21	2.25	24.4	1.1
10	5000	440	14.30	9980	11163	40	291	1.17	-1.13	2.16	24.2	1.1
10	5000	460	14.17	10325	11472	39	277	1.09	-1.06	2.09	23.9	1.1
10	5000	480	14.04	10663	11777	38	265	1.03	-1.00	2.01	23.7	1.2
10	5000	500	13.91	10992	12076	37	253	0.97	-0.94	1.95	23.5	1.2
10	5000	520	13.79	11315	12370	36	242	0.91	-0.89	1.88	23.3	1.2
10	5000	540	13.62	11592	12624	35	233	0.87	-0.85	1.82	23.0	1.2
10	5000	560	13.44	11848	12860	34	225	0.82	-0.80	1.77	22.7	1.2
10	5000	580	13.27	12096	13099	33	218	0.78	-0.77	1.71	22.4	1.3
10	5000	600	13.12	12324	13300	33	212	0.75	-0.73	1.67	22.2	1.3
10	5500	400	15.43	9800	11238	44	338	1.37	-1.33	2.32	26.1	1.2
10	5500	420	15.30	10186	11576	43	321	1.28	-1.24	2.23	25.9	1.2
10	5500	440	15.17	10564	11910	41	306	1.19	-1.16	2.15	25.6	1.3
10	5500	460	15.04	10934	12239	40	292	1.12	-1.09	2.08	25.4	1.3
10	5500	480	14.91	11295	12563	39	279	1.05	-1.03	2.01	25.2	1.3
10	5500	500	14.78	11649	12882	38	267	0.99	-0.97	1.94	25.0	1.3
10	5500	520	14.66	11995	13196	37	256	0.94	-0.92	1.88	24.8	1.3
10	5500	540	14.50	12306	13479	36	246	0.89	-0.87	1.82	24.5	1.4
10	5500	560	14.32	12585	13735	35	238	0.84	-0.83	1.76	24.2	1.4
10	5500	580	14.15	12856	13993	35	230	0.80	-0.79	1.71	23.9	1.4
10	5500	600	13.99	13103	14211	34	223	0.77	-0.75	1.66	23.7	1.5

Figure 6-69 (Sheet 5 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	200	400	1.03	667	696	18	37	0.78	-0.77	2.49	1.7	0.0
15	200	420	0.99	673	702	18	34	0.73	-0.72	2.37	1.7	0.0
15	200	440	0.95	679	706	18	32	0.69	-0.68	2.27	1.6	0.0
15	200	460	0.91	682	711	17	30	0.65	-0.65	2.17	1.5	0.0
15	200	480	0.88	686	715	17	29	0.62	-0.62	2.08	1.5	0.0
15	200	500	0.84	686	714	17	29	0.59	-0.59	2.00	1.4	0.0
15	200	520	0.81	682	711	17	30	0.57	-0.57	1.92	1.4	0.0
15	200	540	0.78	679	707	17	32	0.55	-0.55	1.85	1.3	0.0
15	200	560	0.74	675	704	17	33	0.53	-0.53	1.79	1.3	0.0
15	200	580	0.72	672	701	17	35	0.52	-0.51	1.72	1.2	0.0
15	200	600	0.69	669	699	17	36	0.50	-0.50	1.67	1.2	0.0
15	300	400	1.49	964	1009	19	45	0.82	-0.81	2.49	2.5	0.0
15	300	420	1.43	974	1020	19	42	0.77	-0.76	2.37	2.4	0.0
15	300	440	1.38	984	1029	19	39	0.72	-0.72	2.27	2.3	0.0
15	300	460	1.33	993	1037	18	37	0.68	-0.68	2.17	2.2	0.0
15	300	480	1.29	1000	1044	18	34	0.65	-0.64	2.08	2.2	0.0
15	300	500	1.24	1002	1046	18	34	0.62	-0.61	2.00	2.1	0.0
15	300	520	1.19	999	1043	18	35	0.59	-0.59	1.92	2.0	0.0
15	300	540	1.14	995	1040	18	36	0.57	-0.57	1.85	1.9	0.0
15	300	560	1.10	992	1036	18	37	0.55	-0.55	1.79	1.9	0.0
15	300	580	1.05	989	1033	18	38	0.53	-0.53	1.72	1.8	0.0
15	300	600	1.02	986	1031	18	39	0.51	-0.51	1.67	1.7	0.0
15	400	400	1.92	1242	1305	20	54	0.86	-0.85	2.48	3.2	0.0
15	400	420	1.85	1259	1321	20	50	0.80	-0.79	2.37	3.1	0.0
15	400	440	1.79	1273	1335	20	47	0.76	-0.75	2.26	3.0	0.0
15	400	460	1.73	1287	1348	19	43	0.71	-0.70	2.17	2.9	0.0
15	400	480	1.67	1299	1359	19	41	0.67	-0.67	2.08	2.8	0.0
15	400	500	1.61	1304	1364	19	40	0.64	-0.64	2.00	2.7	0.0
15	400	520	1.55	1302	1362	19	40	0.61	-0.61	1.92	2.6	0.0
15	400	540	1.49	1300	1360	19	41	0.59	-0.58	1.85	2.5	0.0
15	400	560	1.43	1297	1358	18	41	0.57	-0.56	1.79	2.4	0.0
15	400	580	1.38	1295	1355	18	42	0.55	-0.54	1.72	2.3	0.0
15	400	600	1.34	1292	1353	18	42	0.53	-0.52	1.67	2.3	0.0
15	500	400	2.33	1505	1586	21	62	0.89	-0.88	2.48	3.9	0.0
15	500	420	2.25	1528	1608	21	58	0.83	-0.82	2.37	3.8	0.0
15	500	440	2.18	1548	1627	20	54	0.78	-0.77	2.26	3.7	0.0
15	500	460	2.11	1567	1645	20	50	0.74	-0.73	2.16	3.6	0.0
15	500	480	2.04	1585	1662	20	47	0.70	-0.69	2.08	3.5	0.0
15	500	500	1.97	1593	1670	19	45	0.66	-0.66	2.00	3.3	0.0
15	500	520	1.90	1593	1670	19	45	0.63	-0.63	1.92	3.2	0.0
15	500	540	1.83	1593	1669	19	46	0.61	-0.60	1.85	3.1	0.0
15	500	560	1.76	1592	1669	19	46	0.58	-0.58	1.78	3.0	0.0
15	500	580	1.70	1591	1667	19	46	0.56	-0.56	1.72	2.9	0.0
15	500	600	1.64	1589	1666	19	46	0.54	-0.54	1.67	2.8	0.0
15	600	400	2.72	1755	1855	22	71	0.92	-0.91	2.48	4.6	0.0
15	600	420	2.63	1784	1892	22	66	0.86	-0.85	2.36	4.4	0.0
15	600	440	2.55	1811	1908	21	61	0.81	-0.80	2.26	4.3	0.0
15	600	460	2.47	1835	1931	21	57	0.76	-0.75	2.16	4.2	0.0
15	600	480	2.40	1858	1953	20	53	0.72	-0.71	2.08	4.1	0.0
15	600	500	2.32	1872	1965	20	51	0.68	-0.67	1.99	3.9	0.0
15	600	520	2.23	1874	1968	20	51	0.65	-0.64	1.92	3.8	0.0
15	600	540	2.16	1876	1969	20	51	0.62	-0.62	1.85	3.6	0.0
15	600	560	2.08	1877	1971	20	50	0.60	-0.59	1.78	3.5	0.0
15	600	580	2.01	1878	1971	20	50	0.57	-0.57	1.72	3.4	0.0
15	600	600	1.95	1878	1971	19	50	0.55	-0.55	1.67	3.3	0.0
15	700	400	3.09	1994	2113	23	79	0.95	-0.94	2.47	5.2	0.1
15	700	420	3.00	2029	2147	23	73	0.89	-0.87	2.36	5.1	0.1
15	700	440	2.91	2062	2178	22	68	0.83	-0.82	2.26	4.9	0.1
15	700	460	2.82	2093	2207	22	64	0.78	-0.77	2.16	4.8	0.1
15	700	480	2.74	2121	2234	21	59	0.74	-0.73	2.07	4.6	0.1
15	700	500	2.66	2140	2251	21	57	0.70	-0.69	1.99	4.5	0.1
15	700	520	2.56	2145	2257	21	56	0.67	-0.66	1.92	4.3	0.1
15	700	540	2.47	2150	2261	20	55	0.64	-0.63	1.85	4.2	0.1
15	700	560	2.39	2153	2264	20	55	0.61	-0.61	1.78	4.0	0.1
15	700	580	2.31	2156	2267	20	55	0.59	-0.58	1.72	3.9	0.1
15	700	600	2.24	2158	2269	20	54	0.57	-0.56	1.67	3.8	0.1

Figure 6-69 (Sheet 6 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	800	400	3.45	2222	2362	24	86	0.98	-0.96	2.47	5.8	0.1
15	800	420	3.35	2265	2402	23	80	0.91	-0.90	2.36	5.7	0.1
15	800	440	3.25	2304	2439	23	75	0.86	-0.84	2.25	5.5	0.1
15	800	460	3.16	2341	2474	22	70	0.80	-0.79	2.16	5.3	0.1
15	800	480	3.07	2375	2506	22	65	0.76	-0.75	2.07	5.2	0.1
15	800	500	2.98	2399	2529	21	62	0.72	-0.71	1.99	5.0	0.1
15	800	520	2.88	2408	2537	21	61	0.68	-0.68	1.92	4.9	0.1
15	800	540	2.78	2415	2544	21	60	0.65	-0.65	1.85	4.7	0.1
15	800	560	2.69	2422	2551	21	59	0.63	-0.62	1.78	4.6	0.1
15	800	580	2.61	2427	2556	21	59	0.60	-0.59	1.72	4.4	0.1
15	800	600	2.53	2432	2560	20	58	0.58	-0.57	1.67	4.3	0.1
15	900	400	3.79	2442	2602	25	94	1.00	-0.98	2.46	6.4	0.1
15	900	420	3.69	2491	2649	24	87	0.94	-0.92	2.35	6.2	0.1
15	900	440	3.58	2537	2692	24	81	0.88	-0.86	2.25	6.1	0.1
15	900	460	3.49	2580	2732	23	76	0.82	-0.81	2.16	5.9	0.1
15	900	480	3.39	2620	2770	23	71	0.78	-0.76	2.07	5.7	0.1
15	900	500	3.30	2650	2798	22	68	0.73	-0.72	1.99	5.6	0.1
15	900	520	3.19	2662	2810	22	66	0.70	-0.69	1.92	5.4	0.1
15	900	540	3.08	2673	2821	22	65	0.67	-0.66	1.85	5.2	0.1
15	900	560	2.99	2683	2830	21	64	0.64	-0.63	1.78	5.0	0.1
15	900	580	2.89	2691	2838	21	63	0.61	-0.61	1.72	4.9	0.1
15	900	600	2.81	2698	2844	21	62	0.59	-0.58	1.67	4.7	0.1
15	1000	400	4.13	2653	2835	26	101	1.03	-1.01	2.46	7.0	0.1
15	1000	420	4.01	2710	2888	25	94	0.96	-0.94	2.35	6.8	0.1
15	1000	440	3.91	2762	2938	24	88	0.90	-0.88	2.25	6.6	0.1
15	1000	460	3.80	2811	2984	24	82	0.84	-0.83	2.15	6.4	0.1
15	1000	480	3.71	2857	3027	23	77	0.79	-0.78	2.07	6.3	0.1
15	1000	500	3.60	2893	3061	23	73	0.75	-0.74	1.99	6.1	0.1
15	1000	520	3.49	2910	3077	22	71	0.71	-0.70	1.92	5.9	0.1
15	1000	540	3.38	2924	3091	22	70	0.68	-0.67	1.85	5.7	0.1
15	1000	560	3.27	2937	3103	22	68	0.65	-0.64	1.78	5.5	0.1
15	1000	580	3.17	2949	3114	22	67	0.62	-0.62	1.72	5.4	0.1
15	1000	600	3.08	2959	3123	21	66	0.60	-0.59	1.67	5.2	0.1
15	1500	400	5.65	3615	3914	29	133	1.13	-1.10	2.44	9.5	0.2
15	1500	420	5.52	3706	3998	28	125	1.05	-1.03	2.33	9.3	0.2
15	1500	440	5.39	3791	4077	27	117	0.98	-0.96	2.23	9.1	0.2
15	1500	460	5.27	3872	4152	27	109	0.92	-0.90	2.14	8.9	0.2
15	1500	480	5.15	3947	4223	26	103	0.87	-0.85	2.06	8.7	0.2
15	1500	500	5.03	4016	4287	25	97	0.82	-0.80	1.98	8.5	0.2
15	1500	520	4.89	4055	4323	25	94	0.78	-0.76	1.91	8.3	0.2
15	1500	540	4.75	4090	4356	25	91	0.74	-0.73	1.84	8.0	0.2
15	1500	560	4.62	4122	4387	24	89	0.70	-0.69	1.78	7.8	0.2
15	1500	580	4.49	4151	4414	24	86	0.67	-0.66	1.72	7.6	0.2
15	1500	600	4.38	4178	4439	23	84	0.65	-0.64	1.67	7.4	0.2
15	2000	400	7.00	4459	4887	32	161	1.20	-1.18	2.42	11.8	0.3
15	2000	420	6.85	4582	4999	31	151	1.12	-1.10	2.32	11.6	0.3
15	2000	440	6.71	4699	5107	30	142	1.05	-1.03	2.22	11.3	0.3
15	2000	460	6.57	4810	5209	29	134	0.98	-0.97	2.13	11.1	0.3
15	2000	480	6.44	4915	5306	29	126	0.93	-0.91	2.05	10.9	0.3
15	2000	500	6.31	5015	5399	28	119	0.87	-0.86	1.97	10.7	0.3
15	2000	520	6.15	5080	5460	27	114	0.83	-0.81	1.90	10.4	0.3
15	2000	540	6.00	5138	5513	27	111	0.79	-0.78	1.84	10.1	0.3
15	2000	560	5.85	5191	5563	26	107	0.75	-0.74	1.78	9.9	0.3
15	2000	580	5.70	5241	5609	26	104	0.72	-0.71	1.72	9.6	0.3
15	2000	600	5.57	5285	5651	25	101	0.69	-0.68	1.66	9.4	0.3
15	2500	400	8.22	5218	5786	35	186	1.27	-1.24	2.40	13.9	0.4
15	2500	420	8.06	5372	5925	34	175	1.18	-1.16	2.30	13.6	0.4
15	2500	440	7.91	5519	6058	33	165	1.11	-1.08	2.21	13.4	0.4
15	2500	460	7.76	5659	6186	32	155	1.04	-1.02	2.12	13.1	0.4
15	2500	480	7.62	5793	6309	31	147	0.98	-0.96	2.04	12.9	0.4
15	2500	500	7.48	5920	6426	30	139	0.92	-0.90	1.97	12.6	0.4
15	2500	520	7.31	6016	6515	29	133	0.87	-0.86	1.90	12.4	0.4
15	2500	540	7.15	6097	6589	29	128	0.83	-0.82	1.83	12.1	0.4
15	2500	560	6.98	6172	6659	28	124	0.79	-0.78	1.77	11.8	0.4
15	2500	580	6.82	6242	6724	28	120	0.75	-0.74	1.71	11.5	0.4
15	2500	600	6.68	6307	6784	27	117	0.72	-0.71	1.66	11.3	0.4

Figure 6-69 (Sheet 7 of 20)

# **Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	3000	400	9.34	5913	6631	37	239	1.32	-1.29	2.38	15.6	0.5
15	3000	420	9.18	6096	6734	36	197	1.24	-1.21	2.28	15.5	0.5
15	3000	440	9.02	6271	6952	35	186	1.16	-1.13	2.19	15.2	0.5
15	3000	460	8.87	6439	7124	34	175	1.09	-1.06	2.11	15.0	0.5
15	3000	480	8.71	6600	7250	33	166	1.02	-1.00	2.03	14.7	0.5
15	3000	500	8.57	6755	7391	32	157	0.96	-0.94	1.96	14.5	0.5
15	3000	520	8.40	6832	7529	31	150	0.91	-0.90	1.89	14.2	0.5
15	3000	540	8.22	6986	7622	30	145	0.87	-0.85	1.83	13.9	0.5
15	3000	560	8.04	7093	7692	30	140	0.82	-0.81	1.77	13.6	0.5
15	3000	580	7.88	7175	7775	29	135	0.79	-0.77	1.71	13.3	0.5
15	3000	600	7.72	7258	7854	29	131	0.75	-0.74	1.66	13.0	0.5
15	3500	400	10.39	6553	7433	39	230	1.37	-1.34	2.36	17.6	0.6
15	3500	420	10.22	6763	7620	38	217	1.28	-1.25	2.27	17.3	0.6
15	3500	440	10.06	6971	7800	37	205	1.20	-1.17	2.18	17.0	0.6
15	3500	460	9.90	7165	7974	36	194	1.13	-1.10	2.10	16.7	0.6
15	3500	480	9.74	7352	8143	35	183	1.06	-1.04	2.02	16.5	0.6
15	3500	500	9.59	7532	8306	34	174	1.00	-0.98	1.95	16.2	0.6
15	3500	520	9.42	7691	8450	33	166	0.95	-0.93	1.88	15.9	0.6
15	3500	540	9.23	7817	8565	32	160	0.90	-0.88	1.82	15.6	0.6
15	3500	560	9.05	7936	8674	31	154	0.86	-0.84	1.76	15.3	0.6
15	3500	580	8.87	8049	8777	31	149	0.82	-0.80	1.71	15.0	0.6
15	3500	600	8.70	8152	8871	30	145	0.78	-0.77	1.66	14.7	0.6
15	4000	400	11.38	7161	8203	41	249	1.41	-1.38	2.34	19.2	0.7
15	4000	420	11.21	7398	8410	39	235	1.32	-1.29	2.25	18.9	0.7
15	4000	440	11.04	7626	8612	38	222	1.24	-1.21	2.17	18.7	0.7
15	4000	460	10.87	7846	8807	37	211	1.16	-1.14	2.09	18.4	0.7
15	4000	480	10.71	8059	8996	36	200	1.09	-1.07	2.01	18.1	0.7
15	4000	500	10.55	8263	9180	35	190	1.03	-1.01	1.94	17.8	0.7
15	4000	520	10.39	8453	9352	34	181	0.98	-0.96	1.88	17.6	0.7
15	4000	540	10.19	8601	9486	34	174	0.93	-0.91	1.82	17.2	0.7
15	4000	560	10.00	8742	9613	33	168	0.88	-0.87	1.76	16.9	0.7
15	4000	580	9.81	8875	9735	32	162	0.84	-0.83	1.70	16.6	0.7
15	4000	600	9.64	8996	9846	32	157	0.81	-0.79	1.66	16.3	0.8
15	4500	400	12.32	7730	8945	42	266	1.45	-1.41	2.33	20.8	0.8
15	4500	420	12.14	7992	9172	41	252	1.36	-1.32	2.24	20.5	0.8
15	4500	440	11.97	8245	9393	40	239	1.27	-1.24	2.15	20.2	0.8
15	4500	460	11.80	8490	9603	39	227	1.19	-1.17	2.07	19.9	0.8
15	4500	480	11.63	8725	9817	38	215	1.13	-1.10	2.00	19.7	0.8
15	4500	500	11.47	8953	10020	37	205	1.06	-1.04	1.93	19.4	0.8
15	4500	520	11.31	9173	10217	36	195	1.01	-0.99	1.87	19.1	0.8
15	4500	540	11.11	9344	10371	35	188	0.96	-0.94	1.81	18.8	0.9
15	4500	560	10.91	9506	10517	34	181	0.91	-0.89	1.75	18.4	0.9
15	4500	580	10.72	9660	10656	34	175	0.87	-0.85	1.70	18.1	0.9
15	4500	600	10.54	9799	10783	33	169	0.83	-0.82	1.65	17.8	0.9
15	5000	400	13.21	8270	9664	44	283	1.48	-1.45	2.31	22.3	0.9
15	5000	420	13.03	8556	9910	42	268	1.39	-1.36	2.22	22.0	0.9
15	5000	440	12.85	8833	10150	41	254	1.30	-1.27	2.14	21.7	0.9
15	5000	460	12.68	9100	10393	40	241	1.22	-1.20	2.06	21.4	0.9
15	5000	480	12.51	9359	10611	39	230	1.15	-1.13	1.99	21.1	1.0
15	5000	500	12.34	9610	10833	38	219	1.09	-1.07	1.93	20.9	1.0
15	5000	520	12.19	9852	11048	37	209	1.03	-1.01	1.86	20.6	1.0
15	5000	540	11.98	10053	11228	36	200	0.98	-0.96	1.80	20.2	1.0
15	5000	560	11.78	10235	11391	36	193	0.93	-0.92	1.75	19.9	1.0
15	5000	580	11.58	10408	11547	35	187	0.89	-0.87	1.70	19.6	1.0
15	5000	600	11.41	10565	11689	34	181	0.85	-0.84	1.65	19.3	1.0
15	5500	400	14.06	8785	10364	45	299	1.51	-1.48	2.29	23.8	1.0
15	5500	420	13.88	9094	10628	44	283	1.42	-1.38	2.21	23.5	1.0
15	5500	440	13.70	9393	10885	43	269	1.33	-1.30	2.13	23.2	1.1
15	5500	460	13.53	9683	11136	41	256	1.25	-1.22	2.05	22.9	1.1
15	5500	480	13.35	9964	11381	40	243	1.18	-1.16	1.98	22.6	1.1
15	5500	500	13.18	10236	11620	39	232	1.12	-1.09	1.92	22.3	1.1
15	5500	520	13.01	10500	11853	38	221	1.06	-1.04	1.86	22.0	1.1
15	5500	540	12.82	10731	12058	38	213	1.00	-0.98	1.80	21.7	1.1
15	5500	560	12.62	10933	12238	37	205	0.95	-0.94	1.74	21.3	1.1
15	5500	580	12.42	11125	12410	36	198	0.91	-0.90	1.69	21.0	1.1
15	5500	600	12.24	11299	12566	35	192	0.87	-0.86	1.65	20.7	1.2

Figure 6-69 (Sheet 8 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	1500	400	4.66	3030	3381	32	113	1.27	-1.25	2.43	8.2	0.1
20	1500	420	4.72	3090	3435	31	105	1.19	-1.17	2.32	8.0	0.1
20	1500	440	4.59	3146	3485	30	98	1.12	-1.10	2.22	7.8	0.1
20	1500	460	4.46	3199	3532	30	91	1.05	-1.04	2.13	7.5	0.1
20	1500	480	4.34	3246	3576	29	86	0.99	-0.98	2.05	7.3	0.1
20	1500	500	4.22	3289	3614	29	81	0.94	-0.93	1.97	7.1	0.1
20	1500	520	4.09	3308	3633	28	78	0.90	-0.89	1.90	6.9	0.1
20	1500	540	3.96	3326	3649	28	75	0.86	-0.85	1.83	6.7	0.1
20	1500	560	3.84	3342	3663	28	74	0.82	-0.81	1.77	6.5	0.1
20	1500	580	3.73	3356	3676	27	73	0.78	-0.78	1.71	6.3	0.1
20	1500	600	3.62	3366	3687	27	71	0.75	-0.75	1.66	6.1	0.1
20	2000	400	6.11	3794	4269	35	138	1.35	-1.32	2.41	10.3	0.2
20	2000	420	5.95	3860	4365	34	128	1.26	-1.24	2.30	10.1	0.2
20	2000	440	5.80	3960	4436	33	120	1.18	-1.16	2.21	9.8	0.2
20	2000	460	5.65	4035	4503	32	113	1.11	-1.10	2.12	9.6	0.2
20	2000	480	5.51	4105	4566	31	106	1.05	-1.03	2.04	9.3	0.2
20	2000	500	5.38	4171	4626	31	99	0.99	-0.98	1.96	9.1	0.2
20	2000	520	5.22	4209	4660	30	96	0.95	-0.93	1.89	8.8	0.2
20	2000	540	5.07	4242	4690	30	93	0.90	-0.89	1.83	8.6	0.2
20	2000	560	4.93	4271	4716	29	90	0.86	-0.85	1.77	8.3	0.2
20	2000	580	4.80	4298	4741	29	88	0.82	-0.81	1.71	8.1	0.2
20	2000	600	4.67	4322	4763	29	86	0.79	-0.78	1.66	7.9	0.2
20	2500	400	7.26	4492	5140	37	160	1.41	-1.38	2.39	12.3	0.3
20	2500	420	7.08	4602	5237	36	150	1.32	-1.30	2.29	12.0	0.3
20	2500	440	6.92	4706	5329	35	141	1.24	-1.22	2.19	11.7	0.3
20	2500	460	6.76	4804	5416	34	132	1.17	-1.15	2.11	11.4	0.3
20	2500	480	6.60	4897	5498	33	124	1.10	-1.08	2.03	11.2	0.3
20	2500	500	6.45	4984	5576	33	117	1.04	-1.02	1.95	10.9	0.3
20	2500	520	6.28	5045	5630	32	112	0.99	-0.97	1.89	10.6	0.3
20	2500	540	6.12	5094	5674	31	108	0.94	-0.93	1.82	10.3	0.3
20	2500	560	5.96	5139	5715	31	105	0.90	-0.89	1.76	10.1	0.3
20	2500	580	5.80	5180	5752	31	102	0.86	-0.85	1.71	9.8	0.3
20	2500	600	5.66	5217	5786	30	99	0.82	-0.81	1.65	9.6	0.3
20	3000	400	8.32	5136	5948	39	181	1.47	-1.44	2.36	14.1	0.4
20	3000	420	8.14	5271	6065	38	170	1.37	-1.34	2.27	13.8	0.4
20	3000	440	7.96	5399	6176	37	159	1.29	-1.26	2.18	13.5	0.4
20	3000	460	7.79	5520	6282	36	150	1.21	-1.19	2.09	13.2	0.4
20	3000	480	7.62	5634	6383	35	141	1.14	-1.12	2.02	12.9	0.4
20	3000	500	7.46	5742	6479	34	133	1.08	-1.06	1.95	12.6	0.4
20	3000	520	7.29	5826	6555	34	127	1.02	-1.01	1.88	12.3	0.4
20	3000	540	7.10	5894	6613	33	123	0.98	-0.96	1.82	12.0	0.4
20	3000	560	6.93	5955	6668	32	119	0.93	-0.92	1.76	11.7	0.4
20	3000	580	6.76	6012	6719	32	115	0.89	-0.88	1.70	11.4	0.4
20	3000	600	6.61	6063	6764	32	111	0.85	-0.84	1.65	11.2	0.4
20	3500	400	9.33	5738	6721	41	200	1.51	-1.48	2.34	15.8	0.5
20	3500	420	9.13	5897	6857	40	188	1.41	-1.39	2.25	15.4	0.5
20	3500	440	8.94	6047	6987	39	177	1.33	-1.30	2.16	15.1	0.5
20	3500	460	8.76	6190	7111	38	167	1.25	-1.23	2.08	14.8	0.5
20	3500	480	8.59	6326	7230	37	157	1.18	-1.16	2.01	14.5	0.5
20	3500	500	8.41	6455	7343	36	149	1.12	-1.10	1.94	14.2	0.5
20	3500	520	8.24	6567	7441	35	142	1.06	-1.04	1.87	13.9	0.5
20	3500	540	8.04	6660	7515	34	136	1.01	-0.99	1.81	13.6	0.5
20	3500	560	7.85	6728	7584	34	132	0.96	-0.95	1.75	13.3	0.5
20	3500	580	7.67	6800	7648	33	127	0.92	-0.91	1.70	13.0	0.5
20	3500	600	7.51	6865	7706	33	123	0.88	-0.87	1.65	12.7	0.5
20	4000	400	10.27	6305	7466	42	217	1.55	-1.52	2.33	17.4	0.6
20	4000	420	10.07	6466	7620	41	205	1.45	-1.42	2.23	17.0	0.6
20	4000	440	9.88	6659	7768	40	193	1.36	-1.34	2.15	16.7	0.6
20	4000	460	9.69	6824	7910	39	182	1.28	-1.26	2.07	16.4	0.6
20	4000	480	9.50	6981	8046	38	172	1.21	-1.19	2.00	16.1	0.6
20	4000	500	9.32	7130	8176	37	163	1.15	-1.13	1.93	15.8	0.6
20	4000	520	9.14	7268	8296	37	155	1.09	-1.07	1.86	15.5	0.6
20	4000	540	8.94	7366	8384	36	149	1.04	-1.02	1.80	15.1	0.6
20	4000	560	8.74	7463	8467	35	144	0.99	-0.97	1.74	14.8	0.6
20	4000	580	8.55	7551	8545	35	139	0.94	-0.93	1.69	14.5	0.6
20	4000	600	8.38	7630	8615	34	135	0.90	-0.89	1.64	14.2	0.6

Figure 6-69 (Sheet 9 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	4500	400	11.13	6841	8133	44	234	1.59	-1.55	2.31	18.9	0.7
20	4500	420	10.97	7045	8359	43	220	1.49	-1.46	2.22	18.5	0.7
20	4500	440	10.77	7239	8524	42	208	1.40	-1.37	2.13	18.2	0.7
20	4500	460	10.57	7425	8692	41	197	1.32	-1.29	2.06	17.9	0.7
20	4500	480	10.38	7603	8834	40	186	1.24	-1.22	1.99	17.5	0.7
20	4500	500	10.19	7772	8931	39	177	1.18	-1.16	1.92	17.2	0.7
20	4500	520	10.01	7934	9121	38	168	1.12	-1.10	1.85	16.9	0.7
20	4500	540	9.80	8054	9226	37	161	1.06	-1.04	1.79	16.6	0.7
20	4500	560	9.59	8165	9323	36	155	1.01	-1.00	1.74	16.2	0.7
20	4500	580	9.39	8269	9414	36	150	0.97	-0.95	1.69	15.9	0.7
20	4500	600	9.21	8363	9497	35	145	0.93	-0.91	1.64	15.6	0.7
20	5000	400	12.04	7352	8891	45	249	1.62	-1.58	2.29	20.3	0.8
20	5000	420	11.83	7577	9078	44	235	1.52	-1.49	2.20	20.0	0.8
20	5000	440	11.62	7792	9258	43	222	1.43	-1.40	2.12	19.6	0.8
20	5000	460	11.42	7998	9433	42	211	1.34	-1.32	2.05	19.3	0.8
20	5000	480	11.22	8196	9601	41	200	1.27	-1.25	1.97	19.0	0.8
20	5000	500	11.03	8385	9763	40	189	1.20	-1.18	1.91	18.6	0.8
20	5000	520	10.84	8566	9919	39	180	1.14	-1.12	1.85	18.3	0.8
20	5000	540	10.63	8711	10044	38	173	1.09	-1.07	1.79	18.0	0.8
20	5000	560	10.41	8838	10155	38	167	1.03	-1.02	1.73	17.6	0.8
20	5000	580	10.21	8958	10259	37	161	0.99	-0.97	1.68	17.3	0.8
20	5000	600	10.02	9066	10354	36	156	0.95	-0.94	1.64	16.9	0.8
20	5500	400	12.87	7840	9577	46	264	1.65	-1.61	2.27	21.8	0.9
20	5500	420	12.65	8066	9779	45	249	1.55	-1.51	2.19	21.4	0.9
20	5500	440	12.44	8321	9975	44	236	1.45	-1.43	2.11	21.0	0.9
20	5500	460	12.23	8548	10164	43	224	1.37	-1.34	2.03	20.7	0.9
20	5500	480	12.03	8764	10347	42	212	1.29	-1.27	1.96	20.3	0.9
20	5500	500	11.83	8973	10524	41	202	1.23	-1.21	1.90	20.0	0.9
20	5500	520	11.64	9172	10695	40	192	1.16	-1.14	1.84	19.7	0.9
20	5500	540	11.43	9342	10841	39	184	1.11	-1.09	1.78	19.3	0.9
20	5500	560	11.21	9486	10965	39	177	1.06	-1.04	1.73	18.9	0.9
20	5500	580	11.00	9622	11083	38	171	1.01	-0.99	1.68	18.6	0.9
20	5500	600	10.81	9744	11189	37	165	0.97	-0.95	1.63	18.3	1.0
20	6000	400	13.67	8308	10248	48	277	1.67	-1.64	2.25	23.1	1.0
20	6000	420	13.45	8574	10465	46	262	1.57	-1.54	2.17	22.7	1.0
20	6000	440	13.23	8829	10675	45	249	1.48	-1.45	2.09	22.4	1.0
20	6000	460	13.02	9075	10879	44	236	1.39	-1.37	2.02	22.0	1.0
20	6000	480	12.81	9311	11077	43	224	1.32	-1.29	1.95	21.6	1.0
20	6000	500	12.61	9536	11268	42	213	1.25	-1.23	1.89	21.3	1.0
20	6000	520	12.41	9756	11453	41	203	1.18	-1.16	1.83	21.0	1.0
20	6000	540	12.20	9951	11620	40	194	1.13	-1.11	1.77	20.6	1.0
20	6000	560	11.97	10111	11757	40	187	1.08	-1.06	1.72	20.2	1.0
20	6000	580	11.76	10262	11887	39	181	1.03	-1.01	1.67	19.9	1.0
20	6000	600	11.57	10397	12004	38	175	0.99	-0.97	1.63	19.5	1.1
20	6500	400	14.44	8759	10907	49	290	1.70	-1.66	2.24	24.4	1.1
20	6500	420	14.21	9044	11137	47	275	1.59	-1.56	2.16	24.0	1.1
20	6500	440	13.99	9319	11362	46	261	1.50	-1.47	2.08	23.6	1.1
20	6500	460	13.78	9583	11579	45	248	1.42	-1.39	2.01	23.3	1.1
20	6500	480	13.56	9837	11791	44	236	1.34	-1.31	1.94	22.9	1.1
20	6500	500	13.36	10082	11996	43	224	1.27	-1.25	1.88	22.6	1.1
20	6500	520	13.15	10318	12195	42	214	1.20	-1.18	1.82	22.2	1.1
20	6500	540	12.95	10539	12382	41	204	1.15	-1.13	1.77	21.9	1.1
20	6500	560	12.72	10715	12533	41	197	1.09	-1.08	1.72	21.5	1.1
20	6500	580	12.50	10880	12674	40	190	1.05	-1.03	1.67	21.1	1.2
20	6500	600	12.31	11030	12802	39	184	1.00	-0.99	1.62	20.8	1.2
20	7000	400	15.18	9193	11555	50	303	1.72	-1.68	2.22	25.7	1.2
20	7000	420	14.96	9497	11798	48	287	1.61	-1.58	2.14	25.3	1.2
20	7000	440	14.73	9791	12036	47	272	1.52	-1.49	2.07	24.9	1.2
20	7000	460	14.51	10074	12267	46	259	1.44	-1.41	2.00	24.5	1.2
20	7000	480	14.30	10346	12492	45	246	1.36	-1.33	1.93	24.2	1.2
20	7000	500	14.09	10609	12710	44	235	1.29	-1.26	1.87	23.8	1.2
20	7000	520	13.88	10862	12922	43	224	1.22	-1.20	1.82	23.5	1.2
20	7000	540	13.68	11106	13128	42	214	1.16	-1.14	1.76	23.1	1.2
20	7000	560	13.45	11301	13293	42	206	1.11	-1.09	1.71	22.7	1.3
20	7000	580	13.23	11480	13446	41	199	1.06	-1.05	1.66	22.4	1.3
20	7000	600	13.04	11642	13584	40	193	1.02	-1.01	1.62	22.0	1.4

Figure 6-69 (Sheet 10 of 20)



# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	7500	400	15.91	5613	12193	51	314	1.74	-1.70	2.20	26.9	1.3
20	7500	420	15.66	5936	12449	49	298	1.63	-1.60	2.13	26.5	1.3
20	7500	440	15.45	6248	12699	48	283	1.54	-1.51	2.06	26.1	1.3
20	7500	460	15.23	6549	12943	47	270	1.45	-1.43	1.99	25.7	1.3
20	7500	480	15.01	6839	13181	46	257	1.38	-1.35	1.92	25.4	1.3
20	7500	500	14.79	7119	13412	45	245	1.31	-1.28	1.86	25.0	1.3
20	7500	520	14.58	7389	13637	44	234	1.24	-1.22	1.81	24.6	1.3
20	7500	540	14.38	7650	13855	43	224	1.18	-1.16	1.75	24.3	1.3
20	7500	560	14.16	7898	14040	42	215	1.13	-1.11	1.70	23.9	1.4
20	7500	580	13.94	8134	14203	42	208	1.08	-1.06	1.66	23.6	1.4
20	7500	600	13.74	8356	14351	41	201	1.04	-1.02	1.62	23.2	1.5
20	8000	400	16.61	10020	12822	52	325	1.75	-1.72	2.19	28.1	1.4
20	8000	420	16.38	10361	13090	50	309	1.65	-1.62	2.11	27.7	1.4
20	8000	440	16.15	10691	13353	49	294	1.56	-1.53	2.04	27.3	1.4
20	8000	460	15.92	11009	13609	48	280	1.47	-1.44	1.98	26.9	1.4
20	8000	480	15.70	11316	13859	47	267	1.39	-1.37	1.91	26.5	1.4
20	8000	500	15.48	11613	14102	46	255	1.32	-1.30	1.86	26.2	1.4
20	8000	520	15.27	11900	14339	45	243	1.26	-1.23	1.80	25.8	1.5
20	8000	540	15.06	12177	14570	44	233	1.20	-1.18	1.75	25.5	1.5
20	8000	560	14.85	12420	14774	43	224	1.14	-1.12	1.70	25.1	1.5
20	8000	580	14.63	12627	14948	43	216	1.09	-1.08	1.65	24.7	1.6
20	8000	600	14.44	12813	15105	42	210	1.05	-1.04	1.62	24.4	1.7
20	8500	400	17.29	10416	13444	52	336	1.77	-1.73	2.17	29.2	1.5
20	8500	420	17.06	10774	13724	51	320	1.67	-1.63	2.10	28.8	1.5
20	8500	440	16.82	11121	13998	50	304	1.57	-1.54	2.03	28.4	1.5
20	8500	460	16.60	11456	14265	49	290	1.49	-1.46	1.97	28.0	1.5
20	8500	480	16.37	11781	14527	48	277	1.41	-1.38	1.90	27.7	1.6
20	8500	500	16.15	12094	14782	47	264	1.34	-1.31	1.85	27.3	1.6
20	8500	520	15.94	12397	15031	46	253	1.27	-1.25	1.79	26.9	1.6
20	8500	540	15.73	12690	15274	45	242	1.21	-1.19	1.74	26.6	1.6
20	8500	560	15.52	12958	15497	44	232	1.15	-1.14	1.69	26.2	1.6
20	8500	580	15.31	13176	15680	43	224	1.11	-1.09	1.65	25.9	1.7
20	8500	600	15.12	13374	15846	43	218	1.07	-1.05	1.61	25.6	1.8
20	9000	400	17.96	10800	14059	53	346	1.78	-1.75	2.16	30.4	1.6
20	9000	420	17.72	11176	14349	52	330	1.68	-1.65	2.09	29.9	1.6
20	9000	440	17.49	11540	14634	51	314	1.59	-1.56	2.02	29.6	1.6
20	9000	460	17.26	11892	14914	50	299	1.50	-1.47	1.96	29.2	1.7
20	9000	480	17.03	12232	15187	49	286	1.42	-1.40	1.90	28.8	1.7
20	9000	500	16.81	12562	15453	48	273	1.35	-1.33	1.84	28.4	1.7
20	9000	520	16.59	12881	15714	47	261	1.28	-1.26	1.78	28.0	1.7
20	9000	540	16.39	13189	15967	46	250	1.22	-1.20	1.73	27.7	1.7
20	9000	560	16.19	13481	16209	45	240	1.17	-1.15	1.69	27.4	1.7
20	9000	580	15.97	13712	16402	44	232	1.12	-1.10	1.65	27.0	1.8
20	9000	600	15.79	13920	16576	44	225	1.08	-1.06	1.61	26.7	2.0
20	9500	400	18.61	11174	14667	54	356	1.80	-1.76	2.14	31.5	1.7
20	9500	420	18.37	11567	14968	53	339	1.69	-1.66	2.07	31.0	1.7
20	9500	440	18.13	11947	15264	51	323	1.60	-1.57	2.01	30.6	1.7
20	9500	460	17.90	12316	15554	50	309	1.51	-1.49	1.94	30.3	1.8
20	9500	480	17.67	12673	15838	49	295	1.44	-1.41	1.89	29.9	1.8
20	9500	500	17.45	13018	16116	48	282	1.36	-1.34	1.83	29.5	1.8
20	9500	520	17.23	13353	16397	47	270	1.30	-1.28	1.78	29.1	1.8
20	9500	540	17.02	13676	16652	46	259	1.24	-1.22	1.73	28.8	1.8
20	9500	560	16.83	13986	16907	46	248	1.18	-1.16	1.68	28.4	1.9
20	9500	580	16.63	14234	17113	45	240	1.13	-1.12	1.64	28.1	2.0
20	9500	600	16.45	14452	17295	44	233	1.09	-1.08	1.61	27.8	2.2
20	10000	400	19.25	11539	15270	55	366	1.81	-1.77	2.13	32.5	1.8
20	10000	420	19.00	11949	15531	53	348	1.71	-1.67	2.06	32.1	1.8
20	10000	440	18.77	12345	15887	52	332	1.61	-1.58	2.00	31.7	1.9
20	10000	460	18.53	12730	16188	51	317	1.53	-1.50	1.93	31.3	1.9
20	10000	480	18.30	13102	16482	50	303	1.45	-1.42	1.88	30.9	1.9
20	10000	500	18.08	13463	16771	49	290	1.38	-1.35	1.82	30.6	1.9
20	10000	520	17.86	13813	17053	48	278	1.31	-1.29	1.77	30.2	1.9
20	10000	540	17.65	14151	17328	47	267	1.25	-1.23	1.72	29.8	1.9
20	10000	560	17.46	14474	17593	46	256	1.19	-1.17	1.68	29.5	2.0
20	10000	580	17.27	14744	17815	46	247	1.15	-1.13	1.64	29.2	2.1
20	10000	600	17.09	14971	18003	45	240	1.10	-1.09	1.60	28.9	2.3

Figure 6-69 (Sheet 11 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	1500	400	3.77	2173	2640	39	83	1.56	-1.54	2.41	6.4	0.1
30	1500	420	3.64	2201	2664	38	77	1.47	-1.45	2.31	6.2	0.1
30	1500	440	3.52	2227	2685	37	71	1.38	-1.37	2.21	5.9	0.1
30	1500	460	3.40	2251	2705	37	66	1.31	-1.30	2.12	5.7	0.1
30	1500	480	3.29	2272	2723	36	62	1.24	-1.23	2.04	5.6	0.1
30	1500	500	3.18	2290	2738	36	58	1.18	-1.17	1.96	5.4	0.1
30	1500	520	3.07	2295	2742	36	57	1.13	-1.12	1.89	5.2	0.1
30	1500	540	2.97	2299	2745	36	57	1.09	-1.08	1.83	5.0	0.1
30	1500	560	2.87	2302	2748	35	56	1.04	-1.04	1.76	4.8	0.1
30	1500	580	2.78	2305	2750	35	55	1.00	-1.00	1.71	4.7	0.1
30	1500	600	2.69	2307	2751	35	55	0.97	-0.96	1.65	4.5	0.1
30	2000	400	4.84	2778	3423	41	102	1.62	-1.60	2.39	8.2	0.2
30	2000	420	4.68	2821	3458	40	95	1.52	-1.51	2.29	7.9	0.2
30	2000	440	4.53	2860	3490	39	88	1.44	-1.42	2.19	7.7	0.1
30	2000	460	4.39	2897	3520	39	82	1.36	-1.35	2.11	7.4	0.1
30	2000	480	4.25	2930	3547	38	77	1.29	-1.28	2.03	7.2	0.1
30	2000	500	4.13	2961	3573	38	72	1.23	-1.21	1.95	7.0	0.1
30	2000	520	3.99	2974	3584	37	70	1.17	-1.16	1.88	6.7	0.1
30	2000	540	3.86	2984	3592	37	68	1.12	-1.11	1.82	6.5	0.1
30	2000	560	3.74	2993	3600	37	67	1.08	-1.07	1.76	6.3	0.2
30	2000	580	3.63	3001	3606	36	66	1.03	-1.03	1.70	6.1	0.2
30	2000	600	3.52	3007	3611	36	65	1.00	-0.99	1.65	5.9	0.2
30	2500	400	5.84	3343	4174	42	120	1.67	-1.65	2.37	9.9	0.2
30	2500	420	5.66	3401	4221	42	112	1.57	-1.55	2.27	9.6	0.2
30	2500	440	5.49	3455	4265	41	104	1.48	-1.47	2.18	9.3	0.2
30	2500	460	5.33	3505	4305	40	97	1.40	-1.39	2.09	9.0	0.2
30	2500	480	5.17	3551	4343	40	91	1.33	-1.32	2.01	8.7	0.2
30	2500	500	5.03	3594	4378	39	86	1.26	-1.25	1.94	8.5	0.2
30	2500	520	4.89	3619	4399	39	82	1.21	-1.19	1.87	8.2	0.2
30	2500	540	4.72	3637	4414	38	80	1.15	-1.14	1.81	8.0	0.2
30	2500	560	4.58	3653	4427	38	78	1.11	-1.10	1.75	7.7	0.2
30	2500	580	4.45	3668	4439	38	76	1.06	-1.05	1.69	7.5	0.2
30	2500	600	4.32	3680	4449	37	74	1.02	-1.01	1.64	7.3	0.2
30	3000	400	6.79	3874	4900	44	137	1.72	-1.70	2.34	11.5	0.3
30	3000	420	6.59	3949	4959	43	128	1.62	-1.60	2.25	11.1	0.3
30	3000	440	6.40	4018	5014	42	119	1.52	-1.51	2.16	10.8	0.3
30	3000	460	6.22	4082	5066	42	112	1.44	-1.42	2.08	10.5	0.3
30	3000	480	6.05	4141	5114	41	105	1.37	-1.35	2.00	10.2	0.3
30	3000	500	5.89	4197	5159	40	98	1.30	-1.28	1.93	10.0	0.3
30	3000	520	5.72	4236	5191	40	94	1.24	-1.22	1.86	9.7	0.3
30	3000	540	5.55	4263	5213	39	91	1.18	-1.17	1.80	9.4	0.3
30	3000	560	5.39	4287	5232	39	88	1.13	-1.12	1.74	9.1	0.3
30	3000	580	5.24	4309	5250	39	86	1.09	-1.08	1.69	8.9	0.3
30	3000	600	5.10	4328	5266	38	84	1.05	-1.04	1.64	8.6	0.3
30	3500	400	7.69	4377	5604	46	152	1.76	-1.73	2.32	13.0	0.4
30	3500	420	7.48	4468	5675	45	142	1.65	-1.63	2.23	12.6	0.4
30	3500	440	7.28	4552	5742	44	133	1.56	-1.54	2.14	12.3	0.3
30	3500	460	7.08	4631	5805	43	125	1.47	-1.46	2.06	12.0	0.3
30	3500	480	6.89	4704	5863	42	117	1.40	-1.38	1.99	11.7	0.3
30	3500	500	6.72	4772	5918	42	110	1.33	-1.31	1.92	11.4	0.3
30	3500	520	6.54	4828	5963	41	105	1.26	-1.25	1.85	11.0	0.3
30	3500	540	6.35	4864	5992	41	101	1.21	-1.20	1.79	10.7	0.3
30	3500	560	6.18	4897	6019	40	98	1.16	-1.15	1.73	10.4	0.3
30	3500	580	6.01	4927	6044	40	95	1.11	-1.10	1.68	10.2	0.3
30	3500	600	5.86	4953	6065	39	93	1.07	-1.06	1.63	9.9	0.4
30	4000	400	8.56	4856	6291	47	167	1.80	-1.77	2.30	14.5	0.4
30	4000	420	8.33	4962	6374	46	156	1.69	-1.66	2.21	14.1	0.4
30	4000	440	8.11	5062	6452	45	146	1.59	-1.57	2.13	13.7	0.4
30	4000	460	7.91	5155	6525	44	137	1.51	-1.49	2.05	13.4	0.4
30	4000	480	7.71	5243	6594	43	129	1.43	-1.41	1.97	13.0	0.4
30	4000	500	7.51	5324	6659	43	122	1.35	-1.34	1.91	12.7	0.4
30	4000	520	7.33	5397	6717	42	115	1.29	-1.28	1.84	12.4	0.4
30	4000	540	7.13	5443	6755	42	111	1.23	-1.22	1.78	12.0	0.4
30	4000	560	6.94	5485	6789	41	107	1.18	-1.17	1.73	11.7	0.4
30	4000	580	6.76	5524	6820	41	104	1.13	-1.12	1.67	11.4	0.4
30	4000	600	6.59	5558	6848	40	101	1.09	-1.08	1.63	11.1	0.4

Figure 6-69 (Sheet 12 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	4500	400	9.30	5313	6362	48	180	1.83	-1.80	2.28	15.9	0.5
30	4500	420	9.15	5435	7057	47	169	1.72	-1.69	2.19	15.5	0.5
30	4500	440	8.92	5551	7146	46	159	1.62	-1.60	2.11	15.1	0.5
30	4500	460	8.71	5659	7230	45	149	1.53	-1.51	2.03	14.7	0.5
30	4500	480	8.49	5760	7309	45	141	1.45	-1.43	1.96	14.3	0.5
30	4500	500	8.29	5855	7384	44	133	1.38	-1.36	1.90	14.0	0.5
30	4500	520	8.09	5944	7455	43	125	1.31	-1.30	1.83	13.7	0.5
30	4500	540	7.86	6022	7522	43	121	1.25	-1.24	1.77	13.3	0.5
30	4500	560	7.66	6094	7583	42	116	1.20	-1.19	1.72	13.0	0.5
30	4500	580	7.44	6162	7638	42	113	1.15	-1.14	1.67	12.7	0.5
30	4500	600	7.31	6145	7616	41	109	1.11	-1.10	1.62	12.4	0.5
30	5000	400	9.18	5751	7621	49	193	1.85	-1.83	2.26	17.2	0.6
30	5000	420	9.04	5890	7726	48	181	1.75	-1.72	2.17	16.8	0.6
30	5000	440	8.90	6020	7826	47	170	1.65	-1.62	2.09	16.4	0.6
30	5000	460	8.77	6143	7922	47	161	1.56	-1.54	2.02	16.0	0.6
30	5000	480	8.65	6258	8010	46	151	1.48	-1.46	1.95	15.6	0.6
30	5000	500	8.53	6366	8095	45	143	1.40	-1.39	1.89	15.3	0.6
30	5000	520	8.43	6469	8176	44	135	1.34	-1.32	1.82	14.9	0.6
30	5000	540	8.31	6543	8235	44	130	1.27	-1.26	1.77	14.6	0.6
30	5000	560	8.20	6605	8284	43	125	1.22	-1.21	1.71	14.2	0.6
30	5000	580	8.10	6663	8332	43	121	1.17	-1.16	1.66	13.8	0.6
30	5000	600	8.01	6713	8371	42	117	1.13	-1.12	1.62	13.5	0.6
30	5500	400	10.95	6173	8266	50	215	1.88	-1.85	2.24	18.5	0.7
30	5500	420	10.70	6327	8384	49	193	1.77	-1.74	2.16	18.1	0.7
30	5500	440	10.45	6473	8494	48	182	1.67	-1.65	2.08	17.7	0.7
30	5500	460	10.21	6610	8599	48	171	1.58	-1.56	2.01	17.3	0.7
30	5500	480	9.98	6739	8698	47	162	1.50	-1.48	1.94	16.9	0.7
30	5500	500	9.76	6861	8793	46	153	1.42	-1.41	1.88	16.5	0.6
30	5500	520	9.54	6976	8883	45	145	1.36	-1.34	1.82	16.1	0.6
30	5500	540	9.32	7083	8956	44	138	1.29	-1.28	1.76	15.8	0.6
30	5500	560	9.10	7180	9013	44	134	1.24	-1.23	1.71	15.4	0.7
30	5500	580	8.89	7269	9066	43	129	1.19	-1.18	1.66	15.0	0.7
30	5500	600	8.70	7266	9113	43	125	1.14	-1.13	1.61	14.7	0.7
30	6000	400	11.70	6579	8904	51	217	1.90	-1.87	2.22	19.8	0.8
30	6000	420	11.44	6749	9031	50	204	1.79	-1.77	2.14	19.3	0.8
30	6000	440	11.18	6909	9151	49	192	1.69	-1.67	2.06	18.9	0.8
30	6000	460	10.93	7061	9266	48	182	1.62	-1.58	1.99	18.5	0.8
30	6000	480	10.69	7204	9375	48	172	1.52	-1.50	1.93	18.1	0.7
30	6000	500	10.46	7339	9480	47	163	1.44	-1.43	1.87	17.7	0.7
30	6000	520	10.24	7467	9579	46	154	1.37	-1.36	1.81	17.3	0.7
30	6000	540	10.01	7577	9665	45	147	1.31	-1.30	1.75	16.9	0.7
30	6000	560	9.78	7660	9730	45	142	1.26	-1.24	1.70	16.5	0.7
30	6000	580	9.57	7736	9790	44	137	1.20	-1.19	1.65	16.2	0.8
30	6000	600	9.37	7804	9844	44	133	1.16	-1.15	1.61	15.8	0.8
30	6500	400	12.42	6972	9532	52	228	1.92	-1.89	2.20	21.0	0.9
30	6500	420	12.15	7157	9668	51	215	1.81	-1.79	2.12	20.5	0.9
30	6500	440	11.89	7332	9799	50	203	1.71	-1.69	2.05	20.1	0.8
30	6500	460	11.63	7498	9923	49	191	1.62	-1.60	1.98	19.7	0.8
30	6500	480	11.39	7655	10042	48	181	1.54	-1.52	1.92	19.2	0.8
30	6500	500	11.15	7804	10156	48	172	1.46	-1.44	1.86	18.8	0.8
30	6500	520	10.92	7944	10265	47	163	1.39	-1.38	1.80	18.5	0.8
30	6500	540	10.69	8073	10364	46	155	1.33	-1.31	1.74	18.1	0.8
30	6500	560	10.45	8167	10438	46	149	1.27	-1.26	1.69	17.7	0.8
30	6500	580	10.23	8252	10505	45	144	1.22	-1.21	1.65	17.3	0.9
30	6500	600	10.03	8328	10565	44	140	1.18	-1.16	1.60	17.0	0.9
30	7000	400	13.13	7353	10152	53	238	1.94	-1.91	2.19	22.2	1.0
30	7000	420	12.85	7533	10298	52	225	1.83	-1.80	2.11	21.7	0.9
30	7000	440	12.58	7742	10438	51	212	1.73	-1.71	2.04	21.3	0.9
30	7000	460	12.32	7922	10572	50	201	1.64	-1.62	1.97	20.8	0.9
30	7000	480	12.06	8093	10700	49	190	1.55	-1.53	1.91	20.4	0.9
30	7000	500	11.82	8254	10823	48	180	1.48	-1.46	1.85	20.0	0.9
30	7000	520	11.58	8409	10941	48	171	1.41	-1.39	1.79	19.6	0.9
30	7000	540	11.35	8554	11053	47	163	1.34	-1.33	1.74	19.2	0.9
30	7000	560	11.11	8660	11135	46	157	1.29	-1.27	1.69	18.8	0.9
30	7000	580	10.88	8755	11209	46	152	1.24	-1.22	1.64	18.4	1.0
30	7000	600	10.68	8839	11275	45	147	1.19	-1.18	1.60	18.1	1.0

Figure 6-69 (Sheet 13 of 20)

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	7500	400	13.81	7722	11765	54	248	1.96	-1.93	2.17	23.3	1.0
30	7500	420	13.53	7937	11920	53	234	1.85	-1.82	2.09	22.9	1.0
30	7500	440	13.25	8141	11069	52	222	1.75	-1.72	2.02	22.4	1.0
30	7500	460	12.98	8334	11212	51	210	1.65	-1.63	1.96	21.9	1.0
30	7500	480	12.72	8518	11350	50	199	1.57	-1.55	1.89	21.5	1.0
30	7500	500	12.47	8693	11481	49	189	1.49	-1.47	1.84	21.1	1.0
30	7500	520	12.23	8860	11608	48	180	1.42	-1.41	1.78	20.7	1.0
30	7500	540	11.99	9017	11729	48	171	1.36	-1.34	1.73	20.3	1.0
30	7500	560	11.75	9141	11824	47	164	1.30	-1.29	1.68	19.9	1.0
30	7500	580	11.52	9246	11905	46	159	1.25	-1.24	1.64	19.5	1.1
30	7500	600	11.32	9338	11977	46	154	1.20	-1.19	1.60	19.1	1.2
30	8000	400	14.48	8081	11371	55	258	1.97	-1.94	2.15	24.5	1.1
30	8000	420	14.19	8310	11535	54	244	1.86	-1.83	2.08	24.0	1.1
30	8000	440	13.91	8528	11693	53	231	1.76	-1.74	2.01	23.5	1.1
30	8000	460	13.63	8736	11845	52	219	1.67	-1.65	1.95	23.0	1.1
30	8000	480	13.37	8933	11992	51	207	1.59	-1.56	1.88	22.6	1.1
30	8000	500	13.11	9121	12132	50	197	1.51	-1.49	1.83	22.2	1.1
30	8000	520	12.86	9299	12267	49	187	1.44	-1.42	1.77	21.7	1.1
30	8000	540	12.62	9469	12396	48	179	1.37	-1.36	1.72	21.3	1.1
30	8000	560	12.38	9611	12505	48	171	1.31	-1.30	1.67	20.9	1.1
30	8000	580	12.15	9725	12593	47	165	1.26	-1.25	1.63	20.5	1.2
30	8000	600	11.95	9825	12670	47	160	1.22	-1.21	1.59	20.2	1.3
30	8500	400	15.13	8431	11972	56	267	1.99	-1.96	2.14	25.6	1.2
30	8500	420	14.83	8674	12144	55	252	1.88	-1.85	2.06	25.1	1.2
30	8500	440	14.55	8906	12311	53	239	1.78	-1.75	2.00	24.6	1.2
30	8500	460	14.27	9127	12472	52	227	1.68	-1.66	1.93	24.1	1.2
30	8500	480	14.00	9337	12627	52	216	1.60	-1.58	1.87	23.7	1.2
30	8500	500	13.74	9538	12776	51	205	1.52	-1.50	1.82	23.2	1.2
30	8500	520	13.48	9729	12919	50	195	1.45	-1.43	1.76	22.8	1.2
30	8500	540	13.24	9911	13056	49	186	1.39	-1.37	1.71	22.4	1.2
30	8500	560	13.00	10071	13179	48	178	1.33	-1.31	1.67	22.0	1.2
30	8500	580	12.77	10193	13272	48	172	1.28	-1.26	1.63	21.6	1.3
30	8500	600	12.57	10301	13355	47	167	1.23	-1.22	1.59	21.2	1.4
30	9000	400	15.77	8771	12567	56	275	2.00	-1.97	2.12	26.6	1.3
30	9000	420	15.47	9028	12748	55	261	1.89	-1.86	2.05	26.1	1.3
30	9000	440	15.18	9274	12923	54	248	1.79	-1.76	1.98	25.6	1.3
30	9000	460	14.89	9508	13092	53	235	1.70	-1.67	1.92	25.2	1.3
30	9000	480	14.62	9732	13255	52	223	1.61	-1.59	1.86	24.7	1.3
30	9000	500	14.35	9945	13413	51	213	1.53	-1.51	1.81	24.2	1.3
30	9000	520	14.09	10148	13564	51	203	1.46	-1.44	1.76	23.8	1.3
30	9000	540	13.84	10342	13709	50	193	1.40	-1.38	1.71	23.4	1.3
30	9000	560	13.61	10521	13845	49	185	1.34	-1.32	1.66	23.0	1.3
30	9000	580	13.38	10652	13945	48	179	1.29	-1.27	1.62	22.6	1.4
30	9000	600	13.18	10766	14033	48	173	1.24	-1.23	1.59	22.3	1.6
30	9500	400	16.39	9103	13158	57	284	2.01	-1.98	2.10	27.7	1.4
30	9500	420	16.08	9375	13347	56	269	1.90	-1.87	2.04	27.2	1.4
30	9500	440	15.79	9634	13530	55	256	1.80	-1.77	1.97	26.7	1.4
30	9500	460	15.50	9881	13707	54	243	1.71	-1.68	1.91	26.2	1.4
30	9500	480	15.22	10117	13878	53	231	1.62	-1.60	1.85	25.7	1.4
30	9500	500	14.95	10343	14044	52	220	1.55	-1.53	1.80	25.3	1.4
30	9500	520	14.69	10558	14203	51	210	1.48	-1.46	1.75	24.8	1.4
30	9500	540	14.44	10763	14356	50	200	1.41	-1.39	1.70	24.4	1.4
30	9500	560	14.21	10956	14501	50	191	1.35	-1.33	1.66	24.0	1.4
30	9500	580	13.98	11130	14610	49	185	1.30	-1.29	1.62	23.6	1.5
30	9500	600	13.78	11222	14703	49	179	1.26	-1.24	1.58	23.3	1.7
30	10000	400	17.00	9428	13744	58	292	2.02	-1.99	2.09	28.7	1.5
30	10000	420	16.69	9713	13940	56	277	1.91	-1.88	2.02	28.2	1.5
30	10000	440	16.39	9985	14132	55	263	1.81	-1.79	1.96	27.7	1.5
30	10000	460	16.10	10245	14317	54	250	1.72	-1.70	1.90	27.2	1.5
30	10000	480	15.81	10494	14496	54	238	1.64	-1.61	1.84	26.7	1.5
30	10000	500	15.54	10732	14669	53	227	1.56	-1.54	1.79	26.3	1.5
30	10000	520	15.28	10959	14836	52	217	1.49	-1.47	1.74	25.8	1.5
30	10000	540	15.03	11176	14996	51	207	1.42	-1.40	1.69	25.4	1.5
30	10000	560	14.80	11379	15148	50	198	1.36	-1.35	1.65	25.0	1.5
30	10000	580	14.58	11540	15270	50	191	1.31	-1.30	1.61	24.6	1.7
30	10000	600	14.38	11668	15367	49	185	1.27	-1.25	1.58	24.3	1.8

Figure 6-69 (Sheet 14 of 20)

# **Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	1500	400	3.11	1583	2131	46	63	1.82	-1.81	2.41	5.3	0.1
40	1500	420	3.09	1593	2132	46	59	1.72	-1.71	2.30	5.0	0.1
40	1500	440	2.87	1611	2212	45	54	1.63	-1.62	2.21	4.9	0.1
40	1500	460	2.77	1623	2210	45	50	1.55	-1.54	2.12	4.7	0.1
40	1500	480	2.67	1634	2218	45	47	1.48	-1.47	2.03	4.5	0.1
40	1500	500	2.58	1643	2225	44	44	1.41	-1.41	1.96	4.4	0.1
40	1500	520	2.48	1643	2225	44	44	1.36	-1.35	1.89	4.2	0.1
40	1500	540	2.40	1643	2224	44	44	1.30	-1.30	1.82	4.1	0.1
40	1500	560	2.32	1642	2224	44	44	1.25	-1.25	1.76	3.9	0.1
40	1500	580	2.24	1641	2224	44	45	1.21	-1.20	1.70	3.8	0.1
40	1500	600	2.17	1640	2223	44	45	1.17	-1.16	1.65	3.7	0.1
40	2000	400	4.03	2048	2863	48	77	1.87	-1.85	2.38	6.8	0.1
40	2000	420	3.88	2071	2879	47	72	1.77	-1.75	2.28	6.6	0.1
40	2000	440	3.74	2093	2895	47	67	1.67	-1.66	2.19	6.3	0.1
40	2000	460	3.61	2112	2918	46	62	1.59	-1.58	2.10	6.1	0.1
40	2000	480	3.49	2129	2921	46	58	1.51	-1.50	2.02	5.9	0.1
40	2000	500	3.38	2145	2933	46	54	1.44	-1.44	1.94	5.7	0.1
40	2000	520	3.26	2149	2936	45	53	1.38	-1.38	1.88	5.5	0.1
40	2000	540	3.15	2151	2937	45	53	1.33	-1.32	1.81	5.3	0.1
40	2000	560	3.04	2153	2939	45	52	1.28	-1.27	1.75	5.1	0.1
40	2000	580	2.95	2154	2940	45	52	1.23	-1.23	1.69	5.0	0.1
40	2000	600	2.86	2155	2940	45	52	1.19	-1.18	1.64	4.8	0.1
40	2500	400	4.91	2483	3528	49	91	1.91	-1.89	2.35	8.3	0.2
40	2500	420	4.74	2522	3551	49	85	1.80	-1.79	2.26	8.0	0.2
40	2500	440	4.58	2552	3572	48	79	1.71	-1.70	2.17	7.7	0.2
40	2500	460	4.43	2579	3592	48	73	1.62	-1.61	2.08	7.5	0.2
40	2500	480	4.28	2604	3610	47	69	1.54	-1.53	2.00	7.2	0.2
40	2500	500	4.15	2626	3626	47	64	1.47	-1.46	1.93	7.0	0.1
40	2500	520	4.01	2637	3634	46	62	1.41	-1.40	1.86	6.8	0.2
40	2500	540	3.88	2643	3638	46	61	1.35	-1.34	1.80	6.6	0.2
40	2500	560	3.75	2648	3642	46	60	1.30	-1.29	1.74	6.3	0.2
40	2500	580	3.64	2652	3645	46	59	1.25	-1.25	1.69	6.1	0.2
40	2500	600	3.53	2656	3647	46	59	1.21	-1.20	1.63	6.0	0.2
40	3000	400	5.76	2910	4179	51	104	1.95	-1.93	2.33	9.7	0.2
40	3000	420	5.57	2953	4209	50	97	1.84	-1.82	2.23	9.4	0.2
40	3000	440	5.38	2992	4237	49	90	1.74	-1.73	2.15	9.1	0.2
40	3000	460	5.21	3023	4262	49	84	1.65	-1.64	2.07	8.8	0.2
40	3000	480	5.05	3050	4286	48	79	1.57	-1.56	1.99	8.5	0.2
40	3000	500	4.89	3091	4307	48	74	1.50	-1.49	1.92	8.3	0.2
40	3000	520	4.74	3110	4321	47	71	1.43	-1.42	1.85	8.0	0.2
40	3000	540	4.59	3120	4328	47	69	1.37	-1.37	1.79	7.8	0.2
40	3000	560	4.45	3129	4335	47	68	1.32	-1.31	1.73	7.5	0.2
40	3000	580	4.31	3137	4341	46	66	1.27	-1.26	1.68	7.3	0.2
40	3000	600	4.19	3144	4345	46	65	1.23	-1.22	1.63	7.1	0.2
40	3500	400	6.57	3312	4819	52	116	1.98	-1.96	2.30	11.1	0.3
40	3500	420	6.36	3366	4856	51	108	1.87	-1.85	2.21	10.7	0.3
40	3500	440	6.16	3414	4890	50	101	1.77	-1.75	2.13	10.4	0.3
40	3500	460	5.97	3459	4921	50	94	1.68	-1.66	2.05	10.1	0.3
40	3500	480	5.79	3501	4950	49	88	1.60	-1.58	1.98	9.8	0.3
40	3500	500	5.62	3539	4977	49	83	1.52	-1.51	1.91	9.5	0.2
40	3500	520	5.45	3568	4998	48	79	1.45	-1.44	1.84	9.2	0.2
40	3500	540	5.26	3583	5009	48	77	1.39	-1.38	1.78	8.9	0.3
40	3500	560	5.12	3597	5019	48	75	1.34	-1.33	1.72	8.7	0.3
40	3500	580	4.97	3609	5027	47	73	1.29	-1.28	1.67	8.4	0.3
40	3500	600	4.83	3619	5035	47	72	1.24	-1.24	1.62	8.2	0.3
40	4000	400	7.36	3698	5448	53	128	2.01	-1.99	2.28	12.4	0.4
40	4000	420	7.13	3763	5492	52	119	1.89	-1.88	2.19	12.0	0.3
40	4000	440	6.91	3822	5532	51	111	1.79	-1.78	2.11	11.7	0.3
40	4000	460	6.70	3876	5570	51	104	1.70	-1.69	2.03	11.3	0.3
40	4000	480	6.51	3926	5605	50	98	1.62	-1.61	1.96	11.0	0.3
40	4000	500	6.32	3973	5638	50	92	1.54	-1.53	1.89	10.7	0.3
40	4000	520	6.14	4013	5666	49	87	1.47	-1.46	1.83	10.4	0.3
40	4000	540	5.96	4034	5681	49	84	1.41	-1.40	1.77	10.1	0.3
40	4000	560	5.78	4052	5694	48	82	1.36	-1.35	1.72	9.8	0.3
40	4000	580	5.62	4069	5706	48	80	1.30	-1.30	1.66	9.5	0.3
40	4000	600	5.47	4083	5716	48	78	1.26	-1.25	1.62	9.2	0.4

Figure 6-69 (Sheet 15 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	4500	400	8.11	4070	6068	54	139	2.03	-2.01	2.26	13.7	0.4
40	4500	420	7.87	4146	6118	53	129	1.92	-1.90	2.17	13.3	0.4
40	4500	440	7.64	4215	6166	52	121	1.82	-1.80	2.09	12.9	0.4
40	4500	460	7.42	4279	6210	52	113	1.72	-1.71	2.02	12.5	0.4
40	4500	480	7.21	4338	6251	51	107	1.64	-1.63	1.95	12.2	0.4
40	4500	500	7.01	4394	6289	50	100	1.56	-1.55	1.88	11.8	0.4
40	4500	520	6.82	4445	6325	50	94	1.49	-1.48	1.82	11.5	0.4
40	4500	540	6.62	4472	6344	49	91	1.43	-1.42	1.76	11.2	0.4
40	4500	560	6.43	4496	6361	49	89	1.37	-1.36	1.71	10.9	0.4
40	4500	580	6.25	4518	6377	49	86	1.32	-1.31	1.66	10.6	0.4
40	4500	600	6.09	4537	6390	48	84	1.27	-1.27	1.61	10.3	0.4
40	5000	400	8.85	4429	6630	55	149	2.06	-2.03	2.24	15.0	0.5
40	5000	420	8.59	4516	6737	54	139	1.94	-1.92	2.16	14.5	0.5
40	5000	440	8.35	4595	6791	53	130	1.84	-1.82	2.08	14.1	0.5
40	5000	460	8.11	4669	6841	52	122	1.74	-1.73	2.00	13.7	0.5
40	5000	480	7.89	4738	6888	52	115	1.66	-1.64	1.94	13.3	0.4
40	5000	500	7.68	4802	6933	51	108	1.58	-1.57	1.87	13.0	0.4
40	5000	520	7.47	4861	6974	51	102	1.51	-1.50	1.81	12.6	0.4
40	5000	540	7.27	4900	7011	50	98	1.45	-1.44	1.75	12.3	0.4
40	5000	560	7.07	4930	7022	50	95	1.39	-1.38	1.70	11.9	0.4
40	5000	580	6.88	4957	7041	49	92	1.33	-1.33	1.65	11.6	0.5
40	5000	600	6.71	4981	7057	49	90	1.29	-1.28	1.61	11.3	0.5
40	5500	400	9.56	4777	7285	56	159	2.08	-2.05	2.22	16.2	0.6
40	5500	420	9.29	4874	7349	55	149	1.96	-1.94	2.14	15.7	0.6
40	5500	440	9.04	4964	7409	54	139	1.86	-1.84	2.06	15.3	0.5
40	5500	460	8.79	5048	7466	53	131	1.76	-1.75	1.99	14.9	0.5
40	5500	480	8.56	5127	7519	53	123	1.68	-1.66	1.92	14.5	0.5
40	5500	500	8.33	5199	7569	52	116	1.60	-1.58	1.86	14.1	0.5
40	5500	520	8.12	5267	7615	51	110	1.53	-1.51	1.80	13.7	0.5
40	5500	540	7.90	5318	7650	51	105	1.46	-1.45	1.74	13.4	0.5
40	5500	560	7.69	5354	7675	50	102	1.40	-1.39	1.69	13.0	0.5
40	5500	580	7.49	5386	7698	50	99	1.35	-1.34	1.64	12.7	0.5
40	5500	600	7.31	5415	7718	50	96	1.30	-1.29	1.60	12.4	0.6
40	6000	400	10.26	5113	7833	57	168	2.09	-2.07	2.20	17.3	0.6
40	6000	420	9.98	5221	7954	56	157	1.98	-1.96	2.12	16.9	0.6
40	6000	440	9.71	5322	8020	55	148	1.87	-1.86	2.05	16.4	0.6
40	6000	460	9.45	5417	8083	54	139	1.78	-1.76	1.98	16.0	0.6
40	6000	480	9.21	5504	8142	53	131	1.69	-1.68	1.91	15.6	0.6
40	6000	500	8.97	5586	8198	53	124	1.61	-1.60	1.85	15.2	0.6
40	6000	520	8.74	5663	8250	52	117	1.54	-1.53	1.79	14.8	0.6
40	6000	540	8.52	5726	8294	51	111	1.48	-1.46	1.74	14.4	0.6
40	6000	560	8.30	5768	8323	51	108	1.42	-1.41	1.69	14.0	0.6
40	6000	580	8.09	5806	8349	51	104	1.36	-1.35	1.64	13.7	0.6
40	6000	600	7.91	5840	8373	50	102	1.32	-1.31	1.60	13.4	0.7
40	6500	400	10.93	5440	8476	57	177	2.11	-2.09	2.18	18.5	0.7
40	6500	420	10.64	5559	8553	56	166	2.00	-1.97	2.10	18.0	0.7
40	6500	440	10.36	5671	8626	56	156	1.89	-1.87	2.03	17.5	0.7
40	6500	460	10.10	5775	8695	55	147	1.80	-1.78	1.96	17.1	0.7
40	6500	480	9.84	5872	8760	54	139	1.71	-1.69	1.90	16.6	0.7
40	6500	500	9.60	5964	8821	53	131	1.63	-1.61	1.84	16.2	0.6
40	6500	520	9.36	6049	8879	53	124	1.56	-1.54	1.78	15.8	0.6
40	6500	540	9.13	6125	8931	52	118	1.49	-1.48	1.73	15.4	0.6
40	6500	560	8.90	6174	8965	52	114	1.43	-1.42	1.68	15.0	0.6
40	6500	580	8.69	6218	8995	51	110	1.38	-1.37	1.63	14.7	0.7
40	6500	600	8.50	6256	9022	51	107	1.33	-1.32	1.59	14.4	0.7
40	7000	400	11.59	5757	9063	58	185	2.13	-2.10	2.16	19.6	0.8
40	7000	420	11.29	5883	9147	57	174	2.01	-1.99	2.09	19.1	0.8
40	7000	440	11.00	6010	9226	56	164	1.91	-1.89	2.02	18.6	0.8
40	7000	460	10.73	6124	9301	55	155	1.81	-1.79	1.95	18.1	0.8
40	7000	480	10.46	6231	9372	55	146	1.72	-1.71	1.89	17.7	0.7
40	7000	500	10.21	6332	9439	54	138	1.64	-1.63	1.83	17.3	0.7
40	7000	520	9.96	6426	9502	53	131	1.57	-1.56	1.77	16.8	0.7
40	7000	540	9.73	6514	9562	53	124	1.50	-1.49	1.72	16.4	0.7
40	7000	560	9.49	6571	9601	52	120	1.44	-1.43	1.67	16.0	0.7
40	7000	580	9.27	6621	9635	52	116	1.39	-1.38	1.63	15.7	0.8
40	7000	600	9.08	6664	9665	51	112	1.34	-1.33	1.59	15.3	0.8

**Figure 6-69 (Sheet 16 of 20)**

# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
40	7500	400	12.24	6066	9646	59	193	2.14	-2.12	2.14	20.7	0.9
40	7500	420	11.93	6208	9736	58	182	2.02	-2.00	2.07	20.2	0.9
40	7500	440	11.63	6341	9821	57	172	1.92	-1.90	2.00	19.7	0.8
40	7500	460	11.35	6465	9902	56	162	1.82	-1.81	1.94	19.2	0.8
40	7500	480	11.07	6582	9979	55	153	1.74	-1.72	1.88	18.7	0.8
40	7500	500	10.81	6692	10051	55	145	1.65	-1.64	1.82	18.3	0.8
40	7500	520	10.56	6795	10120	54	137	1.58	-1.57	1.76	17.8	0.8
40	7500	540	10.32	6891	10185	53	130	1.51	-1.50	1.71	17.4	0.8
40	7500	560	10.07	6961	10233	53	125	1.45	-1.44	1.66	17.0	0.8
40	7500	580	9.85	7017	10270	52	121	1.40	-1.39	1.62	16.6	0.9
40	7500	600	9.65	7065	10304	52	118	1.35	-1.34	1.58	16.3	0.9
40	8000	400	12.87	6368	10225	59	201	2.15	-2.13	2.13	21.7	1.0
40	8000	420	12.55	6520	10320	58	190	2.04	-2.02	2.05	21.2	0.9
40	8000	440	12.25	6663	10412	58	179	1.93	-1.91	1.99	20.7	0.9
40	8000	460	11.95	6798	10498	57	169	1.84	-1.82	1.92	20.2	0.9
40	8000	480	11.67	6924	10581	56	160	1.75	-1.73	1.86	19.7	0.9
40	8000	500	11.40	7043	10659	55	151	1.67	-1.65	1.81	19.3	0.9
40	8000	520	11.14	7155	10733	55	144	1.59	-1.58	1.75	18.8	0.9
40	8000	540	10.89	7260	10803	54	136	1.52	-1.51	1.70	18.4	0.9
40	8000	560	10.65	7343	10859	53	131	1.46	-1.45	1.66	18.0	0.9
40	8000	580	10.42	7405	10901	53	127	1.41	-1.40	1.62	17.6	0.9
40	8000	600	10.22	7458	10937	53	123	1.36	-1.35	1.58	17.3	1.0
40	8500	400	13.48	6662	10800	60	209	2.17	-2.14	2.11	22.8	1.0
40	8500	420	13.16	6825	10901	59	197	2.05	-2.03	2.04	22.2	1.0
40	8500	440	12.85	6979	10998	58	186	1.94	-1.92	1.97	21.7	1.0
40	8500	460	12.55	7123	11090	57	176	1.85	-1.83	1.91	21.2	1.0
40	8500	480	12.26	7260	11178	57	166	1.76	-1.74	1.85	20.7	1.0
40	8500	500	11.98	7388	11262	56	158	1.68	-1.66	1.80	20.2	1.0
40	8500	520	11.71	7508	11341	55	150	1.60	-1.59	1.75	19.8	0.9
40	8500	540	11.46	7622	11417	54	142	1.54	-1.52	1.70	19.4	0.9
40	8500	560	11.22	7718	11481	54	136	1.47	-1.46	1.65	19.0	1.0
40	8500	580	10.99	7786	11527	53	132	1.42	-1.41	1.61	18.6	1.0
40	8500	600	10.78	7844	11566	53	123	1.38	-1.36	1.58	18.2	1.2
40	9000	400	14.09	6949	11371	61	216	2.18	-2.15	2.09	23.8	1.1
40	9000	420	13.76	7123	11478	60	204	2.06	-2.04	2.03	23.2	1.1
40	9000	440	13.44	7287	11580	59	193	1.95	-1.93	1.96	22.7	1.1
40	9000	460	13.13	7442	11678	58	182	1.86	-1.84	1.90	22.2	1.1
40	9000	480	12.83	7588	11772	57	173	1.77	-1.75	1.84	21.7	1.1
40	9000	500	12.55	7725	11861	56	164	1.69	-1.67	1.79	21.2	1.0
40	9000	520	12.27	7855	11946	56	156	1.61	-1.60	1.74	20.7	1.0
40	9000	540	12.02	7976	12026	55	148	1.55	-1.53	1.69	20.3	1.0
40	9000	560	11.78	8087	12099	54	141	1.49	-1.47	1.64	19.9	1.1
40	9000	580	11.54	8160	12148	54	137	1.43	-1.42	1.61	19.5	1.1
40	9000	600	11.34	8223	12191	54	133	1.39	-1.38	1.57	19.2	1.3
40	9500	400	14.68	7230	11938	61	223	2.19	-2.16	2.08	24.8	1.2
40	9500	420	14.34	7415	12051	60	211	2.07	-2.05	2.01	24.2	1.2
40	9500	440	14.02	7589	12159	59	199	1.96	-1.94	1.95	23.7	1.2
40	9500	460	13.70	7754	12263	58	189	1.87	-1.85	1.89	23.2	1.2
40	9500	480	13.40	7909	12361	58	179	1.78	-1.76	1.83	22.6	1.1
40	9500	500	13.11	8056	12456	57	170	1.70	-1.68	1.78	22.2	1.1
40	9500	520	12.83	8194	12546	56	162	1.62	-1.61	1.73	21.7	1.1
40	9500	540	12.57	8324	12631	56	154	1.56	-1.54	1.68	21.2	1.1
40	9500	560	12.33	8445	12711	55	147	1.50	-1.48	1.64	20.8	1.1
40	9500	580	12.10	8527	12766	55	142	1.44	-1.43	1.60	20.4	1.2
40	9500	600	11.89	8595	12811	54	138	1.40	-1.39	1.57	20.1	1.4
40	10000	400	15.26	7505	12503	62	230	2.20	-2.17	2.06	25.8	1.3
40	10000	420	14.92	7701	12621	61	217	2.08	-2.06	2.00	25.2	1.3
40	10000	440	14.58	7885	12735	60	206	1.97	-1.95	1.94	24.6	1.3
40	10000	460	14.26	8060	12844	59	195	1.88	-1.86	1.88	24.1	1.2
40	10000	480	13.96	8225	12948	58	185	1.79	-1.77	1.82	23.6	1.2
40	10000	500	13.66	8380	13047	57	176	1.71	-1.69	1.77	23.1	1.2
40	10000	520	13.38	8527	13142	57	167	1.63	-1.62	1.72	22.6	1.2
40	10000	540	13.11	8665	13232	56	159	1.57	-1.55	1.67	22.2	1.2
40	10000	560	12.87	8793	13316	55	152	1.51	-1.49	1.63	21.8	1.3
40	10000	580	12.64	8889	13379	55	147	1.45	-1.44	1.60	21.4	1.4
40	10000	600	12.43	8961	13428	55	143	1.41	-1.40	1.56	21.0	1.5

Figure 6-69 (Sheet 17 of 20)

## **Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	1500	400	2.87	1351	2118	50	55	1.94	-1.93	2.41	4.9	0.1
45	1500	420	2.76	1362	2026	50	51	1.84	-1.83	2.30	4.7	0.1
45	1500	440	2.65	1372	2033	50	47	1.75	-1.74	2.20	4.5	0.1
45	1500	460	2.55	1381	2039	49	44	1.66	-1.66	2.11	4.3	0.1
45	1500	480	2.46	1389	2044	49	41	1.59	-1.58	2.03	4.2	0.1
45	1500	500	2.37	1395	2048	49	39	1.52	-1.51	1.96	4.0	0.1
45	1500	520	2.28	1394	2048	49	39	1.46	-1.45	1.89	3.9	0.1
45	1500	540	2.20	1392	2047	49	40	1.40	-1.40	1.82	3.7	0.1
45	1500	560	2.13	1391	2046	49	40	1.35	-1.35	1.76	3.6	0.1
45	1500	580	2.06	1390	2045	48	41	1.30	-1.30	1.70	3.5	0.1
45	1500	600	1.99	1388	2044	48	41	1.26	-1.26	1.65	3.4	0.1
45	2000	400	3.74	1754	2660	52	68	1.98	-1.97	2.38	6.3	0.1
45	2000	420	3.60	1772	2672	51	63	1.88	-1.87	2.28	6.1	0.1
45	2000	440	3.46	1788	2682	51	58	1.78	-1.77	2.18	5.9	0.1
45	2000	460	3.34	1802	2692	50	54	1.70	-1.69	2.10	5.6	0.1
45	2000	480	3.22	1815	2701	50	50	1.62	-1.61	2.02	5.4	0.1
45	2000	500	3.11	1827	2709	50	47	1.54	-1.54	1.94	5.3	0.1
45	2000	520	3.00	1828	2710	50	47	1.48	-1.48	1.87	5.1	0.1
45	2000	540	2.90	1829	2710	49	47	1.42	-1.42	1.81	4.9	0.1
45	2000	560	2.80	1829	2710	49	47	1.37	-1.37	1.75	4.7	0.1
45	2000	580	2.71	1829	2710	49	47	1.32	-1.32	1.69	4.6	0.1
45	2000	600	2.63	1828	2710	49	47	1.28	-1.27	1.64	4.4	0.1
45	2500	400	4.58	2139	3290	53	79	2.02	-2.01	2.35	7.7	0.2
45	2500	420	4.41	2164	3307	52	74	1.91	-1.90	2.25	7.4	0.2
45	2500	440	4.25	2187	3321	52	68	1.81	-1.80	2.16	7.2	0.2
45	2500	460	4.10	2207	3335	51	64	1.72	-1.71	2.08	6.9	0.1
45	2500	480	3.96	2226	3347	51	60	1.64	-1.63	2.00	6.7	0.1
45	2500	500	3.83	2243	3359	51	56	1.57	-1.56	1.93	6.5	0.1
45	2500	520	3.70	2250	3363	50	54	1.50	-1.50	1.86	6.3	0.1
45	2500	540	3.58	2252	3365	50	54	1.44	-1.44	1.80	6.1	0.2
45	2500	560	3.46	2255	3367	50	53	1.39	-1.38	1.74	5.9	0.2
45	2500	580	3.36	2257	3368	50	53	1.34	-1.33	1.68	5.7	0.2
45	2500	600	3.25	2258	3369	50	52	1.29	-1.29	1.63	5.5	0.2
45	3000	400	5.38	2508	3910	54	91	2.05	-2.03	2.32	9.1	0.2
45	3000	420	5.19	2541	3932	54	84	1.94	-1.93	2.23	8.8	0.2
45	3000	440	5.01	2571	3951	53	78	1.84	-1.83	2.14	8.5	0.2
45	3000	460	4.84	2598	3969	52	73	1.75	-1.74	2.06	8.2	0.2
45	3000	480	4.68	2623	3985	52	68	1.67	-1.66	1.99	7.9	0.2
45	3000	500	4.53	2646	4000	52	64	1.59	-1.58	1.92	7.7	0.2
45	3000	520	4.39	2659	4009	51	62	1.52	-1.52	1.85	7.4	0.2
45	3000	540	4.25	2665	4013	51	60	1.46	-1.46	1.79	7.2	0.2
45	3000	560	4.11	2670	4016	51	59	1.41	-1.40	1.73	6.9	0.2
45	3000	580	3.99	2674	4019	51	59	1.35	-1.35	1.68	6.7	0.2
45	3000	600	3.87	2678	4021	50	58	1.31	-1.30	1.63	6.5	0.2
45	3500	400	6.15	2862	4521	55	101	2.08	-2.06	2.30	10.4	0.3
45	3500	420	5.94	2904	4548	55	94	1.96	-1.95	2.21	10.0	0.3
45	3500	440	5.75	2942	4572	54	88	1.86	-1.85	2.12	9.7	0.3
45	3500	460	5.56	2976	4594	53	82	1.77	-1.76	2.04	9.4	0.2
45	3500	480	5.38	3008	4615	53	77	1.69	-1.68	1.97	9.1	0.2
45	3500	500	5.22	3037	4634	52	72	1.61	-1.60	1.90	8.8	0.2
45	3500	520	5.06	3058	4648	52	69	1.54	-1.53	1.84	8.5	0.2
45	3500	540	4.90	3068	4654	52	67	1.48	-1.47	1.78	8.3	0.2
45	3500	560	4.75	3076	4659	52	66	1.42	-1.42	1.72	8.0	0.3
45	3500	580	4.60	3083	4664	51	64	1.37	-1.36	1.67	7.8	0.3
45	3500	600	4.47	3089	4668	51	64	1.32	-1.32	1.62	7.6	0.3
45	4000	400	6.90	3204	5125	56	111	2.10	-2.08	2.28	11.7	0.3
45	4000	420	6.68	3254	5157	55	104	1.99	-1.97	2.19	11.3	0.3
45	4000	440	6.46	3300	5186	55	97	1.88	-1.87	2.11	10.9	0.3
45	4000	460	6.26	3342	5213	54	91	1.79	-1.78	2.03	10.6	0.3
45	4000	480	6.07	3381	5237	54	85	1.71	-1.70	1.96	10.3	0.3
45	4000	500	5.88	3417	5260	53	80	1.63	-1.62	1.89	9.9	0.3
45	4000	520	5.71	3447	5280	53	75	1.56	-1.55	1.83	9.6	0.3
45	4000	540	5.53	3460	5289	52	73	1.50	-1.49	1.77	9.4	0.3
45	4000	560	5.37	3472	5297	52	72	1.44	-1.43	1.71	9.1	0.3
45	4000	580	5.21	3483	5304	52	70	1.38	-1.38	1.66	8.8	0.3
45	4000	600	5.07	3492	5310	52	69	1.34	-1.33	1.61	8.6	0.3

**Figure 6-69 (Sheet 18 of 20)**



# Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	4500	400	7.63	3534	5722	57	121	2.12	-2.11	2.25	12.9	0.4
45	4500	420	7.39	3593	5758	56	113	2.01	-1.99	2.17	12.5	0.4
45	4500	440	7.16	3647	5792	56	105	1.90	-1.89	2.09	12.1	0.4
45	4500	460	6.94	3697	5824	55	99	1.81	-1.80	2.01	11.7	0.4
45	4500	480	6.73	3743	5853	54	93	1.72	-1.71	1.94	11.4	0.3
45	4500	500	6.54	3786	5881	54	87	1.65	-1.64	1.88	11.0	0.3
45	4500	520	6.35	3825	5906	53	82	1.57	-1.56	1.82	10.7	0.3
45	4500	540	6.16	3844	5918	53	80	1.51	-1.50	1.76	10.4	0.3
45	4500	560	5.99	3860	5929	53	77	1.45	-1.44	1.70	10.1	0.4
45	4500	580	5.81	3874	5938	53	76	1.40	-1.39	1.65	9.8	0.4
45	4500	600	5.66	3886	5946	52	74	1.35	-1.34	1.61	9.6	0.4
45	5000	400	8.34	3853	6312	58	130	2.14	-2.12	2.23	14.1	0.5
45	5000	420	8.08	3921	6354	57	121	2.03	-2.01	2.15	13.7	0.4
45	5000	440	7.83	3984	6393	56	114	1.92	-1.91	2.07	13.2	0.4
45	5000	460	7.60	4042	6430	56	107	1.83	-1.81	2.00	12.8	0.4
45	5000	480	7.38	4096	6463	55	100	1.74	-1.73	1.93	12.5	0.4
45	5000	500	7.17	4145	6495	55	94	1.66	-1.65	1.87	12.1	0.4
45	5000	520	6.97	4191	6524	54	89	1.59	-1.58	1.81	11.8	0.4
45	5000	540	6.77	4219	6542	54	85	1.52	-1.51	1.75	11.4	0.4
45	5000	560	6.58	4239	6555	53	83	1.46	-1.46	1.70	11.1	0.4
45	5000	580	6.40	4257	6567	53	81	1.41	-1.40	1.65	10.8	0.4
45	5000	600	6.24	4273	6577	53	79	1.36	-1.36	1.60	10.5	0.5
45	5500	400	9.02	4162	6898	59	139	2.16	-2.14	2.21	15.3	0.5
45	5500	420	8.75	4247	6945	58	130	2.05	-2.03	2.13	14.8	0.5
45	5500	440	8.50	4312	6989	57	121	1.94	-1.92	2.05	14.4	0.5
45	5500	460	8.25	4378	7030	57	114	1.84	-1.83	1.98	13.9	0.5
45	5500	480	8.02	4439	7068	56	107	1.76	-1.74	1.92	13.6	0.5
45	5500	500	7.80	4496	7104	55	101	1.68	-1.67	1.85	13.2	0.5
45	5500	520	7.58	4549	7137	55	95	1.60	-1.59	1.80	12.8	0.4
45	5500	540	7.37	4586	7161	54	91	1.54	-1.53	1.74	12.5	0.5
45	5500	560	7.17	4611	7177	54	89	1.48	-1.47	1.69	12.1	0.5
45	5500	580	6.98	4633	7191	54	86	1.42	-1.41	1.64	11.8	0.5
45	5500	600	6.81	4653	7204	53	84	1.37	-1.37	1.60	11.5	0.5
45	6000	400	9.69	4463	7478	59	147	2.18	-2.16	2.19	16.4	0.6
45	6000	420	9.41	4550	7530	59	138	2.06	-2.04	2.11	15.9	0.6
45	6000	440	9.14	4630	7579	58	129	1.96	-1.94	2.04	15.5	0.6
45	6000	460	8.89	4705	7625	57	121	1.86	-1.84	1.97	15.0	0.6
45	6000	480	8.64	4774	7668	57	114	1.77	-1.76	1.90	14.6	0.5
45	6000	500	8.41	4838	7708	56	108	1.69	-1.68	1.84	14.2	0.5
45	6000	520	8.18	4898	7745	55	102	1.62	-1.61	1.79	13.8	0.5
45	6000	540	7.97	4946	7776	55	97	1.55	-1.54	1.73	13.5	0.5
45	6000	560	7.75	4976	7795	55	94	1.49	-1.48	1.68	13.1	0.5
45	6000	580	7.55	5002	7812	54	91	1.43	-1.43	1.63	12.8	0.6
45	6000	600	7.37	5025	7826	54	89	1.39	-1.38	1.59	12.5	0.6
45	6500	400	10.35	4755	8054	60	155	2.19	-2.17	2.17	17.5	0.7
45	6500	420	10.06	4851	8111	59	145	2.08	-2.06	2.09	17.0	0.7
45	6500	440	9.77	4941	8165	59	136	1.97	-1.95	2.02	16.5	0.6
45	6500	460	9.51	5024	8215	58	128	1.87	-1.86	1.96	16.1	0.6
45	6500	480	9.25	5101	8262	57	121	1.78	-1.77	1.89	15.6	0.6
45	6500	500	9.01	5173	8307	57	114	1.70	-1.69	1.83	15.2	0.6
45	6500	520	8.77	5240	8349	56	109	1.63	-1.62	1.78	14.8	0.6
45	6500	540	8.55	5298	8386	55	102	1.56	-1.55	1.72	14.4	0.6
45	6500	560	8.32	5333	8408	55	99	1.50	-1.49	1.67	14.1	0.6
45	6500	580	8.12	5364	8428	55	96	1.45	-1.44	1.63	13.7	0.6
45	6500	600	7.93	5391	8445	54	94	1.40	-1.39	1.59	13.4	0.7
45	7000	400	10.99	5040	8626	61	162	2.21	-2.19	2.15	18.6	0.7
45	7000	420	10.68	5145	8688	60	152	2.09	-2.07	2.08	18.1	0.7
45	7000	440	10.39	5244	8746	59	143	1.98	-1.97	2.01	17.6	0.7
45	7000	460	10.12	5335	8801	58	135	1.89	-1.87	1.94	17.1	0.7
45	7000	480	9.85	5420	8853	58	127	1.80	-1.78	1.88	16.6	0.7
45	7000	500	9.59	5500	8902	57	120	1.72	-1.70	1.82	16.2	0.7
45	7000	520	9.35	5574	8948	57	114	1.64	-1.63	1.77	15.8	0.6
45	7000	540	9.12	5643	8991	56	108	1.57	-1.56	1.71	15.4	0.6
45	7000	560	8.89	5684	9017	56	104	1.51	-1.50	1.67	15.0	0.7
45	7000	580	8.67	5720	9040	55	101	1.46	-1.45	1.62	14.7	0.7
45	7000	600	8.48	5751	9059	55	98	1.41	-1.40	1.58	14.3	0.8

Figure 6-69 (Sheet 19 of 20)

## Ballistic Table — MK82 Low Drag (Conical Fin) Bomb (Rear Station RPK10)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
45	7500	400	11.61	5318	9194	61	169	2.22	-2.20	2.13	19.6	0.8
45	7500	420	11.30	5432	9261	61	159	2.10	-2.08	2.06	19.1	0.8
45	7500	440	11.00	5539	9324	62	150	1.99	-1.98	1.99	18.6	0.8
45	7500	460	10.71	5639	9384	59	141	1.90	-1.88	1.93	18.1	0.8
45	7500	480	10.44	5733	9442	58	134	1.81	-1.79	1.87	17.6	0.7
45	7500	500	10.17	5822	9493	58	126	1.73	-1.71	1.81	17.2	0.7
45	7500	520	9.92	5901	9543	57	119	1.65	-1.64	1.76	16.8	0.7
45	7500	540	9.68	5977	9590	57	113	1.58	-1.57	1.71	16.4	0.7
45	7500	560	9.44	6029	9623	56	109	1.52	-1.51	1.66	16.0	0.7
45	7500	580	9.22	6069	9648	56	106	1.47	-1.46	1.62	15.6	0.8
45	7500	600	9.03	6104	9670	55	103	1.42	-1.41	1.58	15.3	0.9
45	8000	400	12.23	5589	9759	62	176	2.23	-2.21	2.12	20.7	0.9
45	8000	420	11.90	5713	9830	61	166	2.11	-2.09	2.05	20.1	0.9
45	8000	440	11.59	5829	9898	60	156	2.01	-1.99	1.98	19.6	0.9
45	8000	460	11.30	5937	9962	60	148	1.91	-1.89	1.92	19.1	0.8
45	8000	480	11.01	6038	10023	59	140	1.82	-1.80	1.86	18.6	0.8
45	8000	500	10.74	6133	10081	58	132	1.74	-1.72	1.80	18.1	0.8
45	8000	520	10.48	6222	10135	58	125	1.66	-1.65	1.75	17.7	0.8
45	8000	540	10.23	6305	10186	57	119	1.59	-1.58	1.70	17.3	0.8
45	8000	560	9.99	6368	10225	57	114	1.53	-1.52	1.65	16.9	0.8
45	8000	580	9.77	6413	10253	56	110	1.48	-1.47	1.61	16.5	0.9
45	8000	600	9.57	6451	10277	56	107	1.43	-1.42	1.57	16.2	1.0
45	8500	400	12.83	5853	10320	62	183	2.24	-2.22	2.10	21.7	1.0
45	8500	420	12.49	5987	10397	62	173	2.12	-2.10	2.03	21.1	1.0
45	8500	440	12.18	6112	10469	61	163	2.02	-2.00	1.97	20.6	0.9
45	8500	460	11.87	6228	10538	60	154	1.92	-1.90	1.90	20.1	0.9
45	8500	480	11.58	6338	10603	59	145	1.83	-1.81	1.85	19.6	0.9
45	8500	500	11.30	6441	10664	59	138	1.75	-1.73	1.79	19.1	0.9
45	8500	520	11.03	6537	10723	58	130	1.67	-1.66	1.74	18.6	0.9
45	8500	540	10.78	6627	10778	58	124	1.60	-1.59	1.69	18.2	0.9
45	8500	560	10.54	6702	10824	57	118	1.54	-1.53	1.65	17.8	0.9
45	8500	580	10.31	6751	10855	57	115	1.49	-1.48	1.61	17.4	1.0
45	8500	600	10.11	6793	10881	56	112	1.44	-1.43	1.57	17.1	1.1
45	9000	400	13.41	6112	10879	63	190	2.25	-2.23	2.08	22.7	1.1
45	9000	420	13.08	6255	10960	62	179	2.13	-2.11	2.02	22.1	1.0
45	9000	440	12.75	6389	11037	61	169	2.03	-2.01	1.95	21.5	1.0
45	9000	460	12.44	6514	11110	61	160	1.93	-1.91	1.89	21.0	1.0
45	9000	480	12.14	6632	11179	60	151	1.84	-1.82	1.83	20.5	1.0
45	9000	500	11.85	6742	11245	59	143	1.76	-1.74	1.78	20.0	1.0
45	9000	520	11.57	6846	11308	59	136	1.68	-1.67	1.73	19.6	0.9
45	9000	540	11.31	6942	11366	58	129	1.61	-1.60	1.68	19.1	0.9
45	9000	560	11.07	7030	11420	58	123	1.55	-1.54	1.64	18.7	1.0
45	9000	580	10.84	7083	11453	57	119	1.50	-1.49	1.60	18.3	1.1
45	9000	600	10.64	7130	11482	57	116	1.45	-1.44	1.57	18.0	1.2
45	9500	400	13.99	6366	11436	63	196	2.26	-2.24	2.07	23.6	1.1
45	9500	420	13.65	6518	11521	63	185	2.14	-2.12	2.00	23.1	1.1
45	9500	440	13.31	6662	11602	62	175	2.04	-2.02	1.94	22.5	1.1
45	9500	460	12.99	6794	11679	61	165	1.94	-1.92	1.88	22.0	1.1
45	9500	480	12.68	6920	11753	60	156	1.85	-1.83	1.82	21.4	1.0
45	9500	500	12.39	7038	11823	60	148	1.77	-1.75	1.77	20.9	1.0
45	9500	520	12.11	7149	11889	59	141	1.69	-1.68	1.72	20.5	1.0
45	9500	540	11.85	7253	11952	59	134	1.62	-1.61	1.67	20.0	1.0
45	9500	560	11.60	7348	12010	58	128	1.56	-1.55	1.63	19.6	1.1
45	9500	580	11.37	7411	12048	58	124	1.51	-1.50	1.60	19.2	1.2
45	9500	600	11.17	7461	12079	57	120	1.46	-1.45	1.56	18.9	1.3
45	10000	400	14.56	6614	11990	64	202	2.27	-2.25	2.05	24.6	1.2
45	10000	420	14.21	6775	12079	63	191	2.15	-2.13	1.99	24.0	1.2
45	10000	440	13.87	6927	12165	62	180	2.04	-2.03	1.93	23.4	1.2
45	10000	460	13.54	7069	12246	62	171	1.95	-1.93	1.87	22.9	1.1
45	10000	480	13.22	7203	12324	61	162	1.86	-1.84	1.81	22.3	1.1
45	10000	500	12.92	7329	12398	60	154	1.77	-1.76	1.76	21.8	1.1
45	10000	520	12.64	7447	12468	60	146	1.70	-1.69	1.71	21.4	1.1
45	10000	540	12.37	7557	12534	59	139	1.63	-1.62	1.67	20.9	1.1
45	10000	560	12.13	7659	12596	58	132	1.57	-1.56	1.63	20.5	1.2
45	10000	580	11.90	7733	12641	58	128	1.52	-1.50	1.59	20.1	1.3
45	10000	600	11.69	7786	12674	58	124	1.47	-1.46	1.56	19.8	1.4

Figure 6-69 (Sheet 20 of 20)

**BALLISTIC TABLE - MK82 SNAKEYE BOMB**

Figure 6-70 can be used for sighting calculations for the MK82 Snakeye Bomb dropped from the PM-3 or the RPK10 at all speeds within the bomb release envelope.

The data however is accurate for the performance of the bomb released from the PM-3 at speeds greater than 475 kn TAS but many over-estimate the aim-off angle for bombs released at speeds below 475 kn TAS. The error becomes progressively greater at lower speeds and is in the order of 6 mils at speeds below 440 kn TAS.

For a single bomb released from the RPK10, a 15 mil lateral allowance has to be made to counteract the sideways ejection component of the carrier.

This information has been extracted from ARDU TI 587 and TI 677.

## Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	100	400	2.63	1443	1451	10	73	0.23	-0.22	3.12	4.5	0.9
0	100	420	2.67	1488	1491	9	71	0.22	-0.21	3.02	4.5	1.0
0	100	440	2.65	1525	1529	9	69	0.21	-0.20	2.93	4.5	1.0
0	100	460	2.63	1566	1570	9	67	0.20	-0.19	2.83	4.5	1.0
0	100	480	2.61	1603	1611	9	66	0.18	-0.18	2.74	4.4	1.1
0	100	500	2.59	1646	1649	8	64	0.17	-0.17	2.66	4.4	1.1
0	100	520	2.57	1683	1636	8	63	0.17	-0.16	2.58	4.3	1.1
0	100	540	2.55	1713	1721	8	61	0.16	-0.15	2.50	4.3	1.1
0	100	560	2.55	1753	1761	8	60	0.15	-0.14	2.44	4.3	1.2
0	100	580	2.56	1805	1808	8	58	0.14	-0.14	2.39	4.3	1.2
0	100	600	2.58	1852	1854	8	57	0.14	-0.13	2.35	4.4	1.3
0	150	400	3.38	1699	1706	13	92	0.32	-0.30	3.34	5.7	1.5
0	150	420	3.37	1744	1750	13	89	0.30	-0.28	3.25	5.7	1.5
0	150	440	3.37	1785	1791	13	87	0.29	-0.27	3.18	5.7	1.6
0	150	460	3.35	1834	1840	12	85	0.27	-0.25	3.08	5.7	1.7
0	150	480	3.34	1883	1889	12	83	0.25	-0.24	2.93	5.6	1.7
0	150	500	3.32	1923	1934	12	81	0.24	-0.23	2.90	5.6	1.8
0	150	520	3.30	1972	1978	12	79	0.23	-0.22	2.82	5.6	1.8
0	150	540	3.29	2014	2020	11	77	0.22	-0.21	2.75	5.6	1.8
0	150	560	3.29	2053	2065	11	76	0.21	-0.20	2.69	5.6	1.9
0	150	580	3.31	2110	2115	11	74	0.20	-0.19	2.64	5.6	1.9
0	150	600	3.32	2159	2164	11	72	0.19	-0.18	2.59	5.6	2.0
0	200	400	3.97	1892	1903	16	109	0.40	-0.37	3.53	6.7	2.0
0	200	420	3.98	1939	1949	16	106	0.38	-0.35	3.45	6.7	2.1
0	200	440	3.98	1982	1992	16	104	0.36	-0.34	3.38	6.7	2.2
0	200	460	3.97	2035	2045	16	101	0.34	-0.32	3.28	6.7	2.3
0	200	480	3.96	2089	2099	15	98	0.32	-0.30	3.19	6.7	2.3
0	200	500	3.94	2139	2149	15	96	0.31	-0.29	3.10	6.7	2.4
0	200	520	3.93	2187	2196	15	94	0.29	-0.28	3.03	6.6	2.4
0	200	540	3.92	2233	2242	15	92	0.28	-0.26	2.95	6.6	2.5
0	200	560	3.92	2282	2291	14	90	0.27	-0.25	2.89	6.6	2.6
0	200	580	3.94	2334	2343	14	88	0.26	-0.24	2.84	6.7	2.6
0	200	600	3.96	2390	2398	14	86	0.25	-0.23	2.79	6.7	2.7
0	250	400	4.51	2050	2065	19	125	0.48	-0.44	3.69	7.6	2.5
0	250	420	4.52	2097	2112	19	122	0.46	-0.42	3.61	7.6	2.6
0	250	440	4.53	2141	2156	19	119	0.44	-0.41	3.55	7.6	2.8
0	250	460	4.52	2193	2212	19	116	0.41	-0.39	3.45	7.6	2.9
0	250	480	4.51	2255	2269	18	113	0.39	-0.37	3.36	7.6	2.9
0	250	500	4.50	2303	2322	18	111	0.37	-0.35	3.23	7.6	3.0
0	250	520	4.49	2359	2372	18	108	0.36	-0.34	3.20	7.6	3.1
0	250	540	4.48	2408	2421	18	106	0.34	-0.32	3.13	7.6	3.1
0	250	560	4.49	2453	2471	17	104	0.33	-0.31	3.07	7.6	3.2
0	250	580	4.51	2513	2525	17	102	0.32	-0.30	3.02	7.6	3.3
0	250	600	4.53	2569	2582	17	99	0.30	-0.29	2.96	7.7	3.4
0	300	400	4.99	2183	2204	22	140	0.55	-0.51	3.83	8.4	3.0
0	300	420	5.01	2231	2251	22	137	0.53	-0.49	3.76	8.5	3.2
0	300	440	5.02	2275	2295	22	134	0.51	-0.48	3.70	8.5	3.3
0	300	460	5.02	2334	2353	22	131	0.49	-0.45	3.60	8.5	3.4
0	300	480	5.01	2393	2412	21	128	0.46	-0.43	3.51	8.5	3.5
0	300	500	5.01	2449	2468	21	125	0.44	-0.41	3.43	8.5	3.6
0	300	520	5.00	2503	2521	21	122	0.42	-0.39	3.35	8.5	3.6
0	300	540	4.99	2554	2571	21	120	0.40	-0.38	3.28	8.4	3.7
0	300	560	5.00	2606	2623	20	117	0.39	-0.36	3.22	8.4	3.8
0	300	580	5.02	2661	2678	20	115	0.37	-0.35	3.17	8.5	3.9
0	300	600	5.04	2719	2735	20	112	0.36	-0.34	3.11	8.5	4.0
0	350	400	5.44	2293	2326	25	154	0.63	-0.58	3.96	9.2	3.5
0	350	420	5.47	2347	2373	25	151	0.61	-0.56	3.89	9.2	3.6
0	350	440	5.49	2391	2416	25	148	0.59	-0.55	3.84	9.3	3.8
0	350	460	5.48	2453	2478	25	145	0.56	-0.52	3.74	9.3	3.9
0	350	480	5.43	2513	2537	24	141	0.53	-0.50	3.65	9.3	4.0
0	350	500	5.48	2571	2594	24	138	0.51	-0.47	3.57	9.3	4.1
0	350	520	5.47	2626	2649	24	135	0.49	-0.45	3.49	9.2	4.2
0	350	540	5.47	2679	2702	23	132	0.47	-0.44	3.42	9.2	4.3
0	350	560	5.47	2732	2754	23	130	0.45	-0.42	3.36	9.2	4.4
0	350	580	5.50	2788	2810	23	127	0.43	-0.41	3.31	9.3	4.5
0	350	600	5.52	2847	2868	23	125	0.42	-0.39	3.25	9.3	4.6

**Figure 6-70 (Sheet 1 of 21)**

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb** **(RPK10 — Valid All Airspeeds)** **(PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	400	400	5.87	2402	2435	27	168	0.71	-0.66	4.07	9.9	3.9
0	400	420	5.89	2450	2483	28	165	0.69	-0.63	4.01	10.0	4.1
0	400	440	5.92	2493	2525	28	162	0.67	-0.62	3.96	10.0	4.3
0	400	460	5.92	2556	2587	27	158	0.63	-0.59	3.87	10.0	4.4
0	400	480	5.92	2618	2648	27	154	0.60	-0.56	3.78	10.0	4.5
0	400	500	5.92	2677	2707	27	151	0.58	-0.54	3.69	10.0	4.6
0	400	520	5.91	2734	2763	26	148	0.55	-0.51	3.62	10.0	4.7
0	400	540	5.91	2788	2817	26	145	0.53	-0.50	3.55	10.0	4.8
0	400	560	5.92	2843	2871	26	142	0.51	-0.48	3.48	10.0	4.9
0	400	580	5.94	2904	2931	26	139	0.49	-0.46	3.42	10.0	5.0
0	400	600	5.96	2958	2995	26	137	0.48	-0.45	3.38	10.1	5.1
0	450	400	6.27	2495	2535	30	182	0.73	-0.72	4.18	10.6	4.4
0	450	420	6.30	2542	2582	30	178	0.76	-0.70	4.12	10.6	4.6
0	450	440	6.33	2585	2624	30	175	0.74	-0.68	4.08	10.7	4.8
0	450	460	6.33	2649	2686	30	171	0.71	-0.65	3.98	10.7	4.9
0	450	480	6.33	2712	2749	30	167	0.67	-0.62	3.89	10.7	5.1
0	450	500	6.33	2772	2809	29	164	0.64	-0.60	3.81	10.7	5.2
0	450	520	6.33	2830	2866	29	160	0.62	-0.57	3.73	10.7	5.3
0	450	540	6.33	2886	2921	29	157	0.59	-0.55	3.66	10.7	5.4
0	450	560	6.34	2941	2975	29	154	0.57	-0.53	3.60	10.7	5.5
0	450	580	6.36	3003	3036	28	151	0.55	-0.52	3.54	10.8	5.6
0	450	600	6.39	3058	3091	28	148	0.53	-0.50	3.49	10.8	5.7
0	500	400	6.65	2579	2627	32	195	0.86	-0.79	4.28	11.2	4.8
0	500	420	6.69	2626	2673	33	191	0.84	-0.77	4.23	11.3	5.0
0	500	440	6.72	2668	2714	33	188	0.82	-0.75	4.18	11.4	5.3
0	500	460	6.72	2732	2777	33	184	0.78	-0.72	4.09	11.4	5.4
0	500	480	6.73	2797	2841	32	180	0.74	-0.69	4.00	11.4	5.5
0	500	500	6.73	2858	2902	32	176	0.71	-0.66	3.92	11.4	5.7
0	500	520	6.73	2917	2960	32	172	0.68	-0.63	3.84	11.4	5.8
0	500	540	6.73	2974	3015	31	169	0.66	-0.61	3.77	11.4	5.9
0	500	560	6.73	3029	3070	31	166	0.64	-0.59	3.71	11.4	6.0
0	500	580	6.76	3092	3132	31	163	0.61	-0.57	3.65	11.4	6.1
0	500	600	6.73	3147	3187	31	160	0.59	-0.55	3.60	11.5	6.2
0	550	400	7.02	2656	2713	35	207	0.94	-0.86	4.37	11.9	5.2
0	550	420	7.06	2703	2758	35	204	0.91	-0.84	4.32	11.9	5.5
0	550	440	7.09	2744	2799	35	201	0.89	-0.82	4.28	12.0	5.7
0	550	460	7.10	2808	2852	35	196	0.85	-0.79	4.19	12.0	5.9
0	550	480	7.10	2874	2926	35	192	0.82	-0.75	4.10	12.0	6.0
0	550	500	7.11	2937	2988	34	188	0.79	-0.72	4.02	12.0	6.1
0	550	520	7.11	2996	3047	34	184	0.75	-0.69	3.94	12.0	6.2
0	550	540	7.11	3054	3103	34	181	0.72	-0.67	3.87	12.0	6.4
0	550	560	7.12	3110	3158	34	178	0.70	-0.65	3.81	12.0	6.5
0	550	580	7.14	3173	3220	33	174	0.67	-0.63	3.75	12.1	6.6
0	550	600	7.17	3229	3275	33	171	0.65	-0.61	3.70	12.1	6.7
0	600	400	7.37	2728	2793	37	220	1.02	-0.93	4.46	12.5	5.6
0	600	420	7.41	2774	2838	37	216	0.99	-0.91	4.41	12.5	5.9
0	600	440	7.45	2815	2879	37	213	0.97	-0.89	4.37	12.6	6.2
0	600	460	7.46	2878	2940	37	208	0.93	-0.85	4.29	12.6	6.4
0	600	480	7.47	2945	3005	37	204	0.89	-0.82	4.20	12.6	6.5
0	600	500	7.47	3003	3068	37	200	0.85	-0.78	4.11	12.6	6.6
0	600	520	7.47	3063	3127	36	196	0.82	-0.76	4.04	12.6	6.7
0	600	540	7.47	3127	3184	36	192	0.79	-0.73	3.97	12.6	6.8
0	600	560	7.48	3184	3240	36	189	0.76	-0.71	3.90	12.6	7.0
0	600	580	7.51	3247	3302	36	185	0.74	-0.68	3.84	12.7	7.1
0	600	600	7.54	3303	3357	36	182	0.71	-0.66	3.79	12.7	7.2
0	650	400	7.71	2794	2869	39	232	1.03	-1.00	4.54	13.0	6.0
0	650	420	7.75	2839	2913	39	228	1.06	-0.97	4.50	13.1	6.3
0	650	440	7.80	2880	2953	40	225	1.04	-0.95	4.46	13.2	6.6
0	650	460	7.81	2943	3014	39	220	1.00	-0.92	4.38	13.2	6.8
0	650	480	7.81	3010	3080	39	215	0.96	-0.88	4.29	13.2	6.9
0	650	500	7.82	3075	3143	39	211	0.92	-0.85	4.20	13.2	7.1
0	650	520	7.82	3136	3203	38	207	0.88	-0.82	4.13	13.2	7.2
0	650	540	7.83	3195	3260	38	203	0.85	-0.79	4.06	13.2	7.3
0	650	560	7.84	3257	3321	38	199	0.82	-0.76	3.99	13.2	7.4
0	650	580	7.86	3316	3379	38	196	0.80	-0.74	3.93	13.3	7.6
0	650	600	7.89	3372	3434	38	193	0.77	-0.72	3.88	13.3	7.7

Figure 6-70 (Sheet 2 of 21)

## Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
0	700	400	8.04	2856	2941	41	243	1.17	-1.07	4.62	13.6	6.4
0	700	420	8.09	2901	2994	41	240	1.14	-1.04	4.53	13.7	6.8
0	700	440	8.13	2941	3023	42	237	1.11	-1.02	4.54	13.7	7.1
0	700	460	8.15	3004	3094	41	232	1.07	-0.98	4.46	13.8	7.2
0	700	480	8.15	3072	3150	41	227	1.03	-0.94	4.37	13.8	7.4
0	700	500	8.16	3137	3214	41	222	0.99	-0.91	4.29	13.8	7.5
0	700	520	8.16	3193	3274	41	218	0.95	-0.88	4.21	13.8	7.6
0	700	540	8.17	3258	3332	40	214	0.92	-0.85	4.14	13.8	7.8
0	700	560	8.18	3321	3394	40	210	0.89	-0.82	4.07	13.8	7.9
0	700	580	8.20	3380	3451	40	207	0.86	-0.79	4.02	13.9	8.0
0	700	600	8.23	3436	3507	40	203	0.83	-0.77	3.97	13.9	8.2
0	750	400	8.36	2915	3010	43	255	1.24	-1.13	4.69	14.1	6.8
0	750	420	8.41	2958	3052	43	251	1.21	-1.11	4.66	14.2	7.2
0	750	440	8.46	2998	3090	43	248	1.19	-1.09	4.62	14.3	7.5
0	750	460	8.47	3060	3151	43	243	1.15	-1.05	4.54	14.3	7.7
0	750	480	8.48	3129	3217	43	238	1.10	-1.01	4.45	14.3	7.8
0	750	500	8.49	3194	3281	43	233	1.06	-0.97	4.37	14.3	8.0
0	750	520	8.49	3257	3342	42	229	1.02	-0.94	4.29	14.4	8.1
0	750	540	8.50	3317	3401	42	225	0.98	-0.90	4.22	14.4	8.2
0	750	560	8.51	3380	3462	42	221	0.95	-0.87	4.15	14.4	8.3
0	750	580	8.54	3439	3520	42	217	0.92	-0.85	4.10	14.4	8.5
0	750	600	8.56	3496	3575	42	214	0.89	-0.83	4.05	14.5	8.6
0	800	400	8.67	2969	3075	44	266	1.31	-1.20	4.76	14.6	7.2
0	800	420	8.72	3012	3117	45	263	1.29	-1.17	4.73	14.7	7.6
0	800	440	8.77	3051	3154	45	259	1.26	-1.15	4.70	14.8	7.9
0	800	460	8.79	3113	3214	45	254	1.22	-1.11	4.62	14.9	8.1
0	800	480	8.80	3182	3281	45	249	1.17	-1.07	4.53	14.9	8.2
0	800	500	8.81	3249	3346	45	244	1.12	-1.03	4.45	14.9	8.4
0	800	520	8.81	3312	3407	44	240	1.08	-1.00	4.37	14.9	8.5
0	800	540	8.82	3372	3466	44	235	1.05	-0.96	4.30	14.9	8.7
0	800	560	8.83	3436	3527	44	231	1.01	-0.93	4.23	14.9	8.8
0	800	580	8.86	3495	3585	44	227	0.98	-0.90	4.17	15.0	8.9
0	800	600	8.88	3552	3641	44	224	0.95	-0.88	4.12	15.0	9.1
0	850	400	8.97	3021	3139	46	277	1.39	-1.26	4.83	15.2	7.6
0	850	420	9.03	3064	3179	46	274	1.36	-1.24	4.80	15.3	8.0
0	850	440	9.08	3101	3216	47	270	1.34	-1.22	4.77	15.3	8.3
0	850	460	9.10	3163	3275	47	265	1.29	-1.18	4.70	15.4	8.5
0	850	480	9.11	3233	3343	47	260	1.24	-1.13	4.61	15.4	8.7
0	850	500	9.12	3300	3407	46	255	1.19	-1.09	4.52	15.4	8.8
0	850	520	9.13	3363	3469	46	250	1.15	-1.06	4.45	15.4	9.0
0	850	540	9.13	3429	3533	46	246	1.11	-1.02	4.37	15.4	9.1
0	850	560	9.14	3488	3590	46	242	1.07	-0.99	4.30	15.5	9.2
0	850	580	9.17	3548	3648	46	238	1.04	-0.96	4.25	15.5	9.4
0	850	600	9.20	3605	3703	46	234	1.01	-0.94	4.20	15.5	9.5
0	900	400	9.27	3071	3200	48	288	1.46	-1.33	4.89	15.7	8.0
0	900	420	9.33	3114	3241	48	284	1.43	-1.30	4.86	15.8	8.3
0	900	440	9.38	3149	3275	49	281	1.41	-1.28	4.84	15.9	8.7
0	900	460	9.40	3210	3334	49	276	1.36	-1.24	4.77	15.9	8.9
0	900	480	9.41	3281	3402	48	271	1.31	-1.20	4.68	15.9	9.1
0	900	500	9.42	3348	3467	48	265	1.26	-1.15	4.59	15.9	9.2
0	900	520	9.43	3412	3529	48	261	1.22	-1.11	4.52	15.9	9.4
0	900	540	9.44	3473	3593	48	256	1.17	-1.08	4.44	16.0	9.5
0	900	560	9.45	3537	3650	47	252	1.14	-1.05	4.37	16.0	9.7
0	900	580	9.48	3597	3708	47	248	1.11	-1.02	4.32	16.0	9.8
0	900	600	9.51	3654	3764	47	244	1.08	-0.99	4.27	16.1	10.0
0	950	400	9.56	3118	3259	49	299	1.53	-1.39	4.95	16.1	8.4
0	950	420	9.62	3160	3300	50	295	1.50	-1.37	4.92	16.3	8.7
0	950	440	9.68	3194	3333	50	292	1.48	-1.35	4.91	16.4	9.1
0	950	460	9.70	3255	3391	50	287	1.43	-1.31	4.83	16.4	9.3
0	950	480	9.71	3326	3459	50	281	1.38	-1.26	4.74	16.4	9.5
0	950	500	9.72	3393	3524	50	276	1.33	-1.21	4.66	16.4	9.6
0	950	520	9.73	3458	3586	49	271	1.28	-1.17	4.58	16.4	9.8
0	950	540	9.74	3525	3650	49	266	1.24	-1.14	4.51	16.5	9.9
0	950	560	9.75	3584	3708	49	262	1.20	-1.10	4.44	16.5	10.1
0	950	580	9.78	3644	3766	49	257	1.17	-1.07	4.39	16.5	10.2
0	950	600	9.81	3701	3821	49	254	1.14	-1.04	4.34	16.6	10.4

**Figure 6-70 (Sheet 3 of 21)**

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb** **(RPK10 — Valid All Airspeeds)** **(PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
5	300	400	3.40	1693	1725	19	91	0.71	-0.67	3.33	5.7	1.5
5	300	420	3.36	1730	1756	19	88	0.68	-0.64	3.23	5.7	1.5
5	300	440	3.32	1760	1785	17	85	0.65	-0.61	3.14	5.6	1.6
5	300	460	3.26	1793	1818	17	82	0.61	-0.58	3.03	5.5	1.6
5	300	480	3.21	1827	1851	16	79	0.58	-0.55	2.93	5.4	1.6
5	300	500	3.15	1857	1881	16	76	0.55	-0.52	2.83	5.3	1.6
5	300	520	3.10	1886	1910	15	74	0.52	-0.50	2.74	5.2	1.6
5	300	540	3.05	1913	1936	15	71	0.50	-0.48	2.66	5.2	1.6
5	300	560	3.01	1942	1965	15	69	0.48	-0.46	2.59	5.1	1.6
5	300	580	2.98	1974	1997	14	66	0.46	-0.44	2.52	5.0	1.6
5	300	600	2.96	2008	2030	14	64	0.44	-0.42	2.46	5.0	1.6
5	400	400	4.28	1973	2013	22	116	0.86	-0.82	3.59	7.2	2.3
5	400	420	4.25	2010	2049	22	112	0.83	-0.78	3.50	7.2	2.4
5	400	440	4.22	2044	2082	22	109	0.80	-0.75	3.43	7.1	2.5
5	400	460	4.17	2087	2125	21	105	0.76	-0.71	3.32	7.1	2.5
5	400	480	4.12	2127	2165	21	102	0.72	-0.68	3.22	7.0	2.5
5	400	500	4.07	2166	2203	20	98	0.68	-0.65	3.12	6.9	2.5
5	400	520	4.02	2203	2239	20	95	0.65	-0.62	3.04	6.8	2.5
5	400	540	3.98	2238	2273	19	92	0.63	-0.59	2.95	6.7	2.6
5	400	560	3.94	2274	2308	19	90	0.60	-0.57	2.88	6.7	2.6
5	400	580	3.91	2316	2350	19	86	0.58	-0.55	2.81	6.6	2.6
5	400	600	3.89	2353	2387	18	84	0.55	-0.53	2.75	6.6	2.6
5	500	400	5.08	2193	2249	27	140	1.02	-0.95	3.81	8.6	3.1
5	500	420	5.06	2232	2288	27	136	0.99	-0.92	3.74	8.6	3.2
5	500	440	5.05	2268	2323	27	133	0.95	-0.89	3.67	8.5	3.4
5	500	460	5.00	2316	2370	26	128	0.90	-0.85	3.57	8.5	3.4
5	500	480	4.96	2363	2416	25	124	0.86	-0.81	3.47	8.4	3.4
5	500	500	4.91	2408	2459	25	120	0.82	-0.77	3.37	8.3	3.5
5	500	520	4.87	2451	2501	24	117	0.78	-0.74	3.29	8.2	3.5
5	500	540	4.82	2491	2541	24	113	0.75	-0.71	3.21	8.2	3.5
5	500	560	4.79	2531	2580	24	110	0.72	-0.68	3.14	8.1	3.6
5	500	580	4.77	2578	2626	23	107	0.69	-0.66	3.07	8.1	3.6
5	500	600	4.75	2620	2667	23	104	0.67	-0.64	3.01	8.0	3.6
5	600	400	5.81	2376	2450	31	163	1.17	-1.09	4.01	9.8	3.9
5	600	420	5.81	2416	2490	31	159	1.13	-1.05	3.94	9.8	4.0
5	600	440	5.80	2454	2526	31	155	1.09	-1.02	3.88	9.8	4.2
5	600	460	5.77	2504	2575	31	151	1.04	-0.98	3.79	9.7	4.3
5	600	480	5.73	2556	2625	30	146	1.00	-0.93	3.69	9.7	4.3
5	600	500	5.69	2605	2673	29	142	0.95	-0.89	3.59	9.6	4.4
5	600	520	5.65	2652	2719	29	138	0.91	-0.86	3.51	9.5	4.4
5	600	540	5.61	2696	2762	28	134	0.88	-0.83	3.43	9.5	4.5
5	600	560	5.57	2740	2805	28	131	0.85	-0.80	3.36	9.4	4.5
5	600	580	5.56	2790	2854	28	127	0.81	-0.77	3.29	9.4	4.6
5	600	600	5.54	2835	2898	27	124	0.79	-0.74	3.23	9.4	4.6
5	700	400	6.50	2531	2626	35	186	1.31	-1.22	4.18	11.0	4.6
5	700	420	6.51	2572	2666	35	181	1.27	-1.18	4.13	11.0	4.8
5	700	440	6.51	2610	2702	35	176	1.24	-1.15	4.07	11.0	5.1
5	700	460	6.48	2662	2753	35	173	1.19	-1.11	3.98	11.0	5.1
5	700	480	6.45	2717	2806	34	168	1.13	-1.06	3.89	10.9	5.2
5	700	500	6.41	2770	2857	34	163	1.09	-1.02	3.79	10.8	5.3
5	700	520	6.37	2820	2905	33	159	1.04	-0.98	3.71	10.8	5.3
5	700	540	6.34	2867	2952	33	155	1.00	-0.94	3.63	10.7	5.4
5	700	560	6.30	2913	3001	32	151	0.97	-0.91	3.55	10.7	5.4
5	700	580	6.29	2967	3049	32	147	0.93	-0.88	3.49	10.6	5.5
5	700	600	6.28	3014	3094	32	143	0.90	-0.85	3.43	10.6	5.6
5	800	400	7.15	2667	2794	39	207	1.46	-1.35	4.34	12.1	5.4
5	800	420	7.17	2703	2823	39	203	1.42	-1.32	4.29	12.1	5.6
5	800	440	7.18	2745	2859	39	199	1.33	-1.28	4.24	12.1	5.9
5	800	460	7.16	2793	2910	39	194	1.33	-1.23	4.16	12.1	6.0
5	800	480	7.12	2856	2966	38	189	1.27	-1.18	4.06	12.0	6.1
5	800	500	7.09	2911	3019	38	184	1.22	-1.14	3.97	12.0	6.1
5	800	520	7.06	2964	3070	37	179	1.17	-1.10	3.88	11.9	6.2
5	800	540	7.02	3014	3118	37	175	1.13	-1.06	3.81	11.9	6.3
5	800	560	6.99	3067	3170	36	170	1.09	-1.02	3.73	11.8	6.3
5	800	580	6.99	3118	3219	36	166	1.05	-0.99	3.67	11.8	6.4
5	800	600	6.98	3166	3266	36	163	1.02	-0.96	3.61	11.8	6.5

Figure 6-70 (Sheet 4 of 21)

## Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
5	900	400	7.77	2787	2929	42	228	1.60	-1.48	4.48	13.1	6.1
5	900	420	7.79	2829	2968	42	224	1.56	-1.44	4.44	13.2	6.4
5	900	440	7.81	2864	3002	43	220	1.52	-1.41	4.40	13.2	6.7
5	900	460	7.80	2918	3053	42	215	1.47	-1.36	4.31	13.2	6.8
5	900	480	7.77	2973	3111	42	209	1.41	-1.31	4.22	13.1	6.9
5	900	500	7.73	3035	3166	41	204	1.35	-1.26	4.13	13.1	7.0
5	900	520	7.70	3090	3213	41	199	1.30	-1.21	4.05	13.0	7.1
5	900	540	7.67	3146	3272	41	194	1.25	-1.17	3.96	13.0	7.1
5	900	560	7.65	3196	3321	40	190	1.21	-1.13	3.89	12.9	7.2
5	900	580	7.64	3249	3371	40	185	1.17	-1.10	3.83	12.9	7.3
5	900	600	7.63	3293	3419	40	181	1.14	-1.07	3.77	12.9	7.4
5	1000	400	8.36	2895	3062	45	248	1.74	-1.60	4.61	14.1	6.9
5	1000	420	8.39	2936	3101	46	244	1.70	-1.57	4.57	14.2	7.2
5	1000	440	8.42	2970	3134	46	240	1.67	-1.54	4.54	14.2	7.4
5	1000	460	8.41	3023	3184	46	235	1.61	-1.49	4.46	14.2	7.6
5	1000	480	8.38	3085	3243	45	229	1.54	-1.43	4.36	14.2	7.7
5	1000	500	8.35	3145	3300	45	223	1.49	-1.38	4.28	14.1	7.8
5	1000	520	8.32	3201	3354	45	218	1.43	-1.33	4.19	14.1	7.9
5	1000	540	8.29	3259	3409	44	213	1.38	-1.28	4.11	14.0	8.0
5	1000	560	8.27	3311	3459	44	208	1.34	-1.24	4.04	14.0	8.0
5	1000	580	8.27	3364	3510	43	204	1.29	-1.21	3.98	14.0	8.1
5	1000	600	8.26	3415	3559	43	200	1.26	-1.17	3.92	14.0	8.2
5	1100	400	8.93	2992	3188	48	268	1.88	-1.73	4.73	15.1	7.6
5	1100	420	8.96	3032	3226	49	264	1.84	-1.69	4.70	15.1	7.9
5	1100	440	9.00	3065	3257	49	260	1.80	-1.66	4.67	15.2	8.2
5	1100	460	8.99	3118	3307	49	255	1.75	-1.61	4.60	15.2	8.4
5	1100	480	8.97	3182	3367	49	246	1.68	-1.55	4.50	15.2	8.5
5	1100	500	8.94	3243	3424	48	242	1.62	-1.49	4.41	15.1	8.6
5	1100	520	8.91	3305	3483	48	237	1.56	-1.44	4.32	15.1	8.7
5	1100	540	8.89	3360	3536	47	232	1.50	-1.39	4.25	15.0	8.8
5	1100	560	8.87	3413	3586	47	227	1.46	-1.35	4.18	15.0	8.9
5	1100	580	8.86	3467	3638	47	222	1.41	-1.31	4.12	15.0	9.0
5	1100	600	8.86	3519	3687	46	218	1.38	-1.28	4.06	15.0	9.1
5	1200	400	9.47	3082	3308	51	287	2.01	-1.85	4.84	16.0	8.3
5	1200	420	9.52	3120	3343	51	283	1.97	-1.81	4.81	16.1	8.6
5	1200	440	9.56	3152	3373	52	279	1.94	-1.79	4.79	16.2	9.0
5	1200	460	9.56	3204	3422	52	274	1.88	-1.73	4.72	16.2	9.2
5	1200	480	9.53	3263	3483	51	267	1.81	-1.67	4.63	16.1	9.3
5	1200	500	9.51	3331	3541	51	261	1.75	-1.61	4.54	16.1	9.4
5	1200	520	9.49	3395	3601	51	255	1.68	-1.56	4.45	16.0	9.5
5	1200	540	9.46	3452	3654	50	250	1.63	-1.51	4.38	16.0	9.6
5	1200	560	9.44	3505	3705	50	245	1.58	-1.46	4.31	16.0	9.7
5	1200	580	9.44	3561	3757	50	240	1.53	-1.42	4.25	16.0	9.8
5	1200	600	9.44	3613	3807	50	236	1.49	-1.39	4.19	16.0	9.9
5	1300	400	10.00	3164	3421	53	305	2.14	-1.96	4.94	16.9	9.0
5	1300	420	10.05	3201	3455	54	301	2.10	-1.93	4.92	17.0	9.3
5	1300	440	10.10	3232	3483	54	298	2.08	-1.91	4.90	17.1	9.7
5	1300	460	10.11	3283	3531	54	293	2.02	-1.85	4.84	17.1	9.9
5	1300	480	10.08	3349	3593	54	286	1.94	-1.79	4.74	17.0	10.0
5	1300	500	10.06	3412	3652	54	279	1.88	-1.73	4.66	17.0	10.2
5	1300	520	10.04	3477	3712	53	273	1.81	-1.67	4.57	17.0	10.3
5	1300	540	10.02	3535	3766	53	268	1.75	-1.62	4.49	16.9	10.4
5	1300	560	10.00	3589	3818	53	263	1.70	-1.57	4.42	16.9	10.5
5	1300	580	10.00	3645	3870	53	258	1.65	-1.53	4.36	16.9	10.6
5	1300	600	10.00	3699	3920	52	253	1.61	-1.49	4.31	16.9	10.7
5	1400	400	10.52	3240	3530	56	324	2.27	-2.08	5.04	17.8	9.6
5	1400	420	10.57	3276	3562	56	320	2.23	-2.05	5.02	17.9	10.0
5	1400	440	10.63	3305	3599	57	316	2.21	-2.02	5.00	18.0	10.4
5	1400	460	10.64	3355	3635	57	311	2.15	-1.97	4.95	18.0	10.7
5	1400	480	10.62	3422	3698	57	304	2.07	-1.90	4.85	17.9	10.8
5	1400	500	10.60	3491	3761	56	297	2.00	-1.84	4.76	17.9	10.9
5	1400	520	10.58	3552	3818	56	291	1.93	-1.78	4.68	17.9	11.0
5	1400	540	10.56	3611	3873	56	285	1.87	-1.73	4.61	17.8	11.1
5	1400	560	10.54	3666	3925	55	280	1.82	-1.68	4.54	17.8	11.2
5	1400	580	10.54	3723	3977	55	275	1.77	-1.63	4.48	17.8	11.4
5	1400	600	10.54	3777	4028	55	270	1.72	-1.59	4.42	17.8	11.5

**Figure 6-70 (Sheet 5 of 21)**



# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb** **(RPK10 — Valid All Airspeeds)** **(PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
5	1500	400	11.02	3310	3634	53	341	2.39	-2.19	5.12	18.6	10.3
5	1500	420	11.08	3345	3666	58	337	2.36	-2.16	5.11	18.7	10.7
5	1500	440	11.14	3373	3692	59	334	2.34	-2.14	5.10	18.8	11.1
5	1500	460	11.16	3421	3736	59	329	2.23	-2.09	5.05	18.9	11.4
5	1500	480	11.14	3490	3798	59	321	2.20	-2.02	4.95	18.8	11.5
5	1500	500	11.12	3559	3853	58	314	2.12	-1.95	4.86	18.8	11.6
5	1500	520	11.10	3622	3920	58	308	2.06	-1.89	4.78	18.8	11.8
5	1500	540	11.08	3681	3975	58	302	1.99	-1.84	4.71	18.7	11.9
5	1500	560	11.06	3737	4027	53	297	1.94	-1.78	4.64	18.7	12.0
5	1500	580	11.06	3794	4080	57	292	1.89	-1.74	4.58	18.7	12.1
5	1500	600	11.06	3852	4133	57	286	1.84	-1.69	4.52	18.7	12.3
5	1600	400	11.51	3376	3736	60	358	2.52	-2.30	5.21	19.5	11.0
5	1600	420	11.57	3410	3766	60	354	2.49	-2.27	5.19	19.6	11.4
5	1600	440	11.64	3437	3791	61	351	2.46	-2.25	5.19	19.7	11.8
5	1600	460	11.66	3493	3833	61	346	2.41	-2.21	5.14	19.7	12.1
5	1600	480	11.65	3552	3896	61	339	2.33	-2.13	5.05	19.7	12.3
5	1600	500	11.63	3623	3960	60	331	2.25	-2.06	4.96	19.7	12.4
5	1600	520	11.61	3686	4018	60	325	2.18	-2.00	4.88	19.6	12.5
5	1600	540	11.59	3746	4073	60	319	2.11	-1.94	4.81	19.6	12.6
5	1600	560	11.58	3803	4126	60	313	2.05	-1.89	4.74	19.6	12.7
5	1600	580	11.58	3860	4179	60	308	2.00	-1.84	4.68	19.6	12.9
5	1600	600	11.58	3918	4232	59	303	1.95	-1.80	4.62	19.6	13.0
5	1700	400	11.99	3438	3835	62	375	2.64	-2.41	5.23	20.3	11.6
5	1700	420	12.06	3470	3864	62	371	2.61	-2.38	5.27	20.4	12.1
5	1700	440	12.13	3496	3898	63	368	2.59	-2.36	5.27	20.5	12.5
5	1700	460	12.16	3540	3927	63	363	2.54	-2.32	5.23	20.6	12.8
5	1700	480	12.14	3615	3995	63	355	2.45	-2.24	5.14	20.5	13.0
5	1700	500	12.13	3682	4055	62	348	2.37	-2.17	5.05	20.5	13.1
5	1700	520	12.11	3746	4113	62	341	2.30	-2.11	4.98	20.5	13.2
5	1700	540	12.09	3806	4169	62	335	2.23	-2.05	4.90	20.4	13.4
5	1700	560	12.08	3864	4222	62	330	2.17	-1.99	4.83	20.4	13.5
5	1700	580	12.08	3925	4277	61	324	2.11	-1.94	4.77	20.4	13.6
5	1700	600	12.08	3980	4329	61	319	2.06	-1.90	4.72	20.4	13.8
5	1800	400	12.46	3496	3932	63	391	2.75	-2.52	5.35	21.1	12.3
5	1800	420	12.53	3527	3960	64	387	2.73	-2.49	5.35	21.2	12.8
5	1800	440	12.61	3552	3982	64	385	2.71	-2.47	5.35	21.3	13.2
5	1800	460	12.65	3594	4020	65	380	2.66	-2.43	5.32	21.4	13.5
5	1800	480	12.63	3670	4087	64	372	2.57	-2.35	5.22	21.3	13.7
5	1800	500	12.62	3737	4148	64	364	2.49	-2.28	5.14	21.3	13.8
5	1800	520	12.60	3802	4206	64	358	2.42	-2.21	5.06	21.3	14.0
5	1800	540	12.59	3863	4262	64	351	2.35	-2.15	4.99	21.3	14.1
5	1800	560	12.57	3921	4315	63	346	2.28	-2.10	4.92	21.2	14.2
5	1800	580	12.57	3982	4370	63	340	2.23	-2.04	4.86	21.2	14.4
5	1800	600	12.57	4038	4421	63	334	2.17	-2.00	4.81	21.3	14.5
5	1900	400	12.92	3551	4027	65	407	2.87	-2.62	5.42	21.8	12.9
5	1900	420	13.00	3581	4054	65	403	2.84	-2.60	5.42	22.0	13.4
5	1900	440	13.08	3605	4075	66	401	2.83	-2.58	5.42	22.1	13.9
5	1900	460	13.13	3645	4110	66	396	2.78	-2.54	5.40	22.2	14.2
5	1900	480	13.11	3721	4178	66	388	2.63	-2.46	5.30	22.2	14.4
5	1900	500	13.10	3789	4239	66	380	2.61	-2.38	5.22	22.1	14.5
5	1900	520	13.08	3854	4297	65	373	2.53	-2.32	5.14	22.1	14.7
5	1900	540	13.07	3916	4353	65	367	2.46	-2.25	5.07	22.1	14.8
5	1900	560	13.05	3975	4406	65	361	2.40	-2.20	5.01	22.1	14.9
5	1900	580	13.05	4036	4461	65	355	2.34	-2.14	4.94	22.1	15.1
5	1900	600	13.06	4092	4512	65	350	2.28	-2.09	4.89	22.1	15.2
5	2000	400	13.37	3603	4121	66	422	2.98	-2.72	5.48	22.6	13.6
5	2000	420	13.46	3632	4146	67	419	2.96	-2.70	5.49	22.7	14.1
5	2000	440	13.55	3655	4166	67	416	2.94	-2.68	5.49	22.9	14.6
5	2000	460	13.60	3696	4203	68	412	2.90	-2.64	5.47	23.0	14.9
5	2000	480	13.58	3763	4267	67	403	2.81	-2.56	5.38	23.0	15.1
5	2000	500	13.57	3833	4328	67	396	2.72	-2.49	5.30	22.9	15.2
5	2000	520	13.56	3903	4386	67	389	2.65	-2.42	5.22	22.9	15.4
5	2000	540	13.54	3966	4442	67	382	2.57	-2.35	5.15	22.9	15.5
5	2000	560	13.53	4023	4497	67	376	2.51	-2.29	5.08	22.9	15.6
5	2000	580	13.53	4087	4550	66	370	2.45	-2.24	5.02	22.9	15.8
5	2000	600	13.53	4143	4601	66	365	2.39	-2.19	4.97	22.9	15.9

Figure 6-70 (Sheet 6 of 21)

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	300	400	2.29	1271	1305	18	62	0.82	-0.79	2.97	3.9	0.6
10	300	420	2.23	1286	1320	17	59	0.77	-0.75	2.85	3.8	0.7
10	300	440	2.16	1299	1333	17	57	0.73	-0.71	2.74	3.7	0.7
10	300	460	2.10	1313	1347	16	54	0.69	-0.67	2.63	3.5	0.6
10	300	480	2.03	1325	1359	16	52	0.65	-0.63	2.52	3.4	0.6
10	300	500	1.96	1337	1370	16	50	0.62	-0.60	2.42	3.3	0.6
10	300	520	1.90	1347	1380	15	49	0.59	-0.57	2.33	3.2	0.6
10	300	540	1.85	1356	1389	15	47	0.56	-0.54	2.25	3.1	0.6
10	300	560	1.80	1367	1399	15	45	0.54	-0.52	2.17	3.0	0.6
10	300	580	1.76	1380	1412	15	43	0.51	-0.50	2.10	3.0	0.6
10	300	600	1.72	1394	1425	14	41	0.49	-0.48	2.03	2.9	0.5
10	400	400	3.05	1559	1609	21	80	0.97	-0.93	3.20	5.2	1.2
10	400	420	2.99	1581	1630	20	77	0.92	-0.88	3.09	5.0	1.2
10	400	440	2.93	1601	1650	20	74	0.88	-0.84	3.00	4.9	1.3
10	400	460	2.85	1623	1671	20	71	0.83	-0.80	2.88	4.8	1.2
10	400	480	2.78	1643	1691	19	68	0.79	-0.76	2.77	4.7	1.2
10	400	500	2.70	1662	1709	19	65	0.75	-0.72	2.67	4.6	1.2
10	400	520	2.64	1679	1726	18	63	0.71	-0.68	2.58	4.5	1.2
10	400	540	2.57	1695	1742	18	60	0.68	-0.65	2.49	4.3	1.2
10	400	560	2.51	1712	1758	18	58	0.65	-0.63	2.42	4.2	1.1
10	400	580	2.46	1733	1779	17	55	0.62	-0.60	2.34	4.2	1.1
10	400	600	2.42	1752	1797	17	53	0.59	-0.57	2.28	4.1	1.1
10	500	400	3.78	1800	1968	24	100	1.12	-1.07	3.42	6.4	1.8
10	500	420	3.72	1827	1994	24	96	1.07	-1.02	3.32	6.3	1.9
10	500	440	3.67	1852	1918	24	92	1.03	-0.98	3.23	6.2	1.9
10	500	460	3.59	1881	1947	23	88	0.98	-0.93	3.12	6.1	1.9
10	500	480	3.52	1909	1973	22	85	0.93	-0.88	3.01	5.9	1.9
10	500	500	3.44	1935	1993	22	81	0.89	-0.84	2.91	5.8	1.9
10	500	520	3.37	1959	2022	21	78	0.84	-0.80	2.82	5.7	1.9
10	500	540	3.30	1981	2043	21	75	0.80	-0.77	2.73	5.6	1.9
10	500	560	3.24	2004	2065	21	73	0.77	-0.74	2.65	5.5	1.8
10	500	580	3.19	2032	2092	20	70	0.74	-0.71	2.58	5.4	1.8
10	500	600	3.14	2056	2116	20	67	0.71	-0.68	2.51	5.3	1.8
10	600	400	4.48	2005	2093	28	119	1.27	-1.20	3.62	7.6	2.5
10	600	420	4.43	2036	2123	28	115	1.22	-1.16	3.53	7.5	2.6
10	600	440	4.39	2065	2150	27	111	1.18	-1.11	3.45	7.4	2.6
10	600	460	4.31	2099	2183	27	107	1.12	-1.06	3.34	7.3	2.7
10	600	480	4.24	2133	2216	26	103	1.07	-1.01	3.23	7.2	2.6
10	600	500	4.16	2165	2247	25	99	1.02	-0.96	3.13	7.0	2.6
10	600	520	4.09	2195	2275	25	95	0.97	-0.92	3.04	6.9	2.6
10	600	540	4.02	2223	2302	24	92	0.93	-0.88	2.95	6.8	2.6
10	600	560	3.96	2251	2329	24	89	0.89	-0.85	2.87	6.7	2.6
10	600	580	3.91	2284	2362	23	85	0.85	-0.82	2.80	6.6	2.6
10	600	600	3.87	2314	2390	23	82	0.82	-0.79	2.73	6.5	2.6
10	700	400	5.15	2183	2292	31	133	1.42	-1.34	3.79	8.7	3.2
10	700	420	5.11	2215	2324	31	134	1.37	-1.29	3.72	8.6	3.3
10	700	440	5.07	2247	2353	31	130	1.32	-1.25	3.64	8.6	3.4
10	700	460	5.01	2285	2390	30	126	1.26	-1.19	3.54	8.5	3.4
10	700	480	4.93	2324	2428	30	121	1.20	-1.14	3.43	8.3	3.4
10	700	500	4.86	2361	2463	29	116	1.15	-1.09	3.33	8.2	3.4
10	700	520	4.79	2396	2496	29	112	1.10	-1.04	3.24	8.1	3.4
10	700	540	4.72	2429	2528	28	109	1.06	-1.00	3.16	8.0	3.4
10	700	560	4.66	2464	2561	27	105	1.01	-0.96	3.07	7.9	3.4
10	700	580	4.61	2499	2595	27	101	0.98	-0.93	3.00	7.8	3.4
10	700	600	4.57	2532	2627	26	98	0.94	-0.90	2.94	7.7	3.4
10	800	400	5.79	2333	2471	35	158	1.56	-1.47	3.96	9.8	3.8
10	800	420	5.76	2372	2504	35	154	1.51	-1.42	3.89	9.7	4.0
10	800	440	5.73	2405	2534	35	149	1.47	-1.38	3.82	9.7	4.1
10	800	460	5.67	2446	2574	34	144	1.40	-1.32	3.72	9.6	4.2
10	800	480	5.60	2490	2615	33	139	1.34	-1.26	3.62	9.5	4.2
10	800	500	5.53	2531	2654	33	134	1.29	-1.21	3.52	9.3	4.2
10	800	520	5.46	2570	2691	32	130	1.23	-1.16	3.43	9.2	4.2
10	800	540	5.40	2605	2726	31	126	1.18	-1.12	3.34	9.1	4.2
10	800	560	5.33	2645	2764	31	122	1.14	-1.07	3.25	9.0	4.2
10	800	580	5.29	2684	2801	30	118	1.10	-1.04	3.17	8.9	4.2
10	800	600	5.25	2721	2836	30	114	1.06	-1.00	3.11	8.9	4.3

Figure 6-70 (Sheet 7 of 21)

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb** **(RPK10 — Valid All Airspeeds)** **(PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	900	400	6.40	2475	2633	38	177	1.71	-1.60	4.11	10.8	4.5
10	900	420	6.38	2512	2668	38	172	1.65	-1.55	4.04	10.8	4.7
10	900	440	6.36	2543	2698	38	168	1.61	-1.51	3.99	10.8	4.9
10	900	460	6.31	2587	2739	38	163	1.55	-1.45	3.89	10.7	5.0
10	900	480	6.24	2634	2784	37	157	1.48	-1.39	3.79	10.5	5.0
10	900	500	6.17	2677	2826	36	152	1.42	-1.33	3.69	10.4	5.0
10	900	520	6.11	2721	2866	36	147	1.35	-1.28	3.60	10.3	5.0
10	900	540	6.04	2764	2907	35	143	1.30	-1.23	3.51	10.2	5.0
10	900	560	5.99	2803	2944	34	139	1.26	-1.19	3.43	10.1	5.0
10	900	580	5.94	2845	2984	34	134	1.22	-1.15	3.37	10.0	5.1
10	900	600	5.91	2894	3021	34	130	1.18	-1.11	3.30	10.0	5.1
10	1000	400	6.39	2537	2763	41	196	1.84	-1.72	4.24	11.8	5.2
10	1000	420	6.38	2635	2818	41	191	1.79	-1.67	4.18	11.8	5.4
10	1000	440	6.37	2667	2848	41	187	1.75	-1.63	4.14	11.8	5.6
10	1000	460	6.32	2712	2890	41	181	1.68	-1.57	4.05	11.7	5.7
10	1000	480	6.26	2762	2937	40	175	1.61	-1.51	3.95	11.6	5.7
10	1000	500	6.19	2810	2982	40	170	1.55	-1.45	3.85	11.5	5.8
10	1000	520	6.13	2853	3025	39	165	1.49	-1.40	3.76	11.4	5.8
10	1000	540	6.07	2901	3069	38	160	1.43	-1.34	3.67	11.3	5.8
10	1000	560	6.01	2942	3108	38	155	1.38	-1.30	3.59	11.2	5.8
10	1000	580	6.07	2986	3149	37	151	1.33	-1.26	3.53	11.1	5.9
10	1000	600	6.04	3028	3188	37	147	1.29	-1.22	3.46	11.0	5.9
10	1100	400	7.56	2703	2923	44	214	1.98	-1.84	4.37	12.8	5.9
10	1100	420	7.56	2745	2958	44	209	1.93	-1.80	4.32	12.8	6.1
10	1100	440	7.56	2777	2987	44	205	1.89	-1.76	4.28	12.8	6.4
10	1100	460	7.52	2823	3030	44	200	1.82	-1.70	4.19	12.7	6.5
10	1100	480	7.45	2876	3079	43	193	1.75	-1.63	4.09	12.6	6.5
10	1100	500	7.39	2926	3126	43	188	1.68	-1.57	4.00	12.5	6.5
10	1100	520	7.33	2977	3174	42	182	1.61	-1.51	3.90	12.4	6.6
10	1100	540	7.27	3023	3217	42	177	1.55	-1.46	3.82	12.3	6.6
10	1100	560	7.22	3066	3257	41	172	1.50	-1.41	3.74	12.2	6.6
10	1100	580	7.18	3111	3300	41	168	1.45	-1.37	3.68	12.1	6.7
10	1100	600	7.15	3155	3341	40	163	1.41	-1.33	3.61	12.1	6.7
10	1200	400	8.11	2810	3056	47	232	2.11	-1.96	4.49	13.7	6.6
10	1200	420	8.12	2846	3089	47	227	2.06	-1.92	4.44	13.7	6.8
10	1200	440	8.12	2878	3118	47	223	2.02	-1.88	4.40	13.7	7.1
10	1200	460	8.09	2923	3160	47	218	1.96	-1.82	4.33	13.7	7.2
10	1200	480	8.03	2979	3211	47	211	1.88	-1.75	4.23	13.6	7.3
10	1200	500	7.97	3031	3260	46	205	1.81	-1.68	4.13	13.5	7.3
10	1200	520	7.91	3084	3310	45	199	1.74	-1.62	4.04	13.4	7.3
10	1200	540	7.85	3132	3354	45	194	1.68	-1.57	3.96	13.3	7.4
10	1200	560	7.80	3177	3396	44	189	1.62	-1.52	3.88	13.2	7.4
10	1200	580	7.77	3224	3440	44	184	1.57	-1.47	3.82	13.1	7.5
10	1200	600	7.74	3269	3482	44	180	1.53	-1.43	3.75	13.1	7.5
10	1300	400	8.65	2903	3180	50	249	2.24	-2.03	4.59	14.6	7.2
10	1300	420	8.66	2938	3213	50	245	2.19	-2.04	4.55	14.6	7.5
10	1300	440	8.67	2969	3241	50	241	2.15	-2.00	4.52	14.7	7.8
10	1300	460	8.65	3015	3283	50	235	2.09	-1.94	4.45	14.6	8.0
10	1300	480	8.59	3072	3335	49	228	2.01	-1.87	4.35	14.5	8.0
10	1300	500	8.53	3126	3385	49	222	1.93	-1.80	4.26	14.4	8.1
10	1300	520	8.47	3181	3437	48	216	1.86	-1.73	4.17	14.3	8.1
10	1300	540	8.42	3230	3482	48	210	1.80	-1.68	4.09	14.2	8.2
10	1300	560	8.37	3277	3525	47	205	1.74	-1.63	4.01	14.1	8.2
10	1300	580	8.34	3326	3571	47	200	1.69	-1.58	3.95	14.1	8.3
10	1300	600	8.31	3372	3614	47	196	1.64	-1.54	3.89	14.0	8.3
10	1400	400	9.17	2988	3300	52	267	2.37	-2.19	4.69	15.5	7.9
10	1400	420	9.19	3023	3331	52	262	2.32	-2.15	4.66	15.5	8.2
10	1400	440	9.21	3053	3358	53	258	2.28	-2.12	4.63	15.6	8.5
10	1400	460	9.19	3098	3400	53	253	2.22	-2.06	4.57	15.5	8.7
10	1400	480	9.13	3157	3453	52	246	2.13	-1.98	4.47	15.4	8.8
10	1400	500	9.08	3216	3508	51	239	2.05	-1.91	4.37	15.3	8.8
10	1400	520	9.02	3270	3557	51	232	1.98	-1.84	4.29	15.2	8.9
10	1400	540	8.97	3320	3603	50	227	1.92	-1.79	4.21	15.2	8.9
10	1400	560	8.92	3368	3648	50	222	1.86	-1.73	4.13	15.1	9.0
10	1400	580	8.89	3413	3694	50	217	1.80	-1.68	4.07	15.0	9.0
10	1400	600	8.86	3466	3738	49	212	1.75	-1.64	4.01	15.0	9.1

Figure 6-70 (Sheet 8 of 21)

## Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
10	1500	400	9.67	3067	3414	54	233	2.43	-2.31	4.79	16.3	8.6
10	1500	420	9.70	3101	3445	55	279	2.45	-2.26	4.76	16.4	8.9
10	1500	440	9.73	3130	3471	55	275	2.41	-2.23	4.74	16.4	9.2
10	1500	460	9.72	3174	3511	55	270	2.35	-2.17	4.68	16.4	9.4
10	1500	480	9.66	3235	3566	54	262	2.26	-2.10	4.58	16.3	9.5
10	1500	500	9.61	3296	3621	54	255	2.19	-2.02	4.48	16.2	9.5
10	1500	520	9.56	3351	3671	53	249	2.10	-1.95	4.40	16.2	9.6
10	1500	540	9.51	3403	3719	53	243	2.04	-1.89	4.32	16.1	9.7
10	1500	560	9.46	3452	3764	53	238	1.98	-1.84	4.25	16.0	9.7
10	1500	580	9.43	3503	3810	52	232	1.92	-1.79	4.18	15.9	9.8
10	1500	600	9.40	3554	3857	52	227	1.87	-1.74	4.12	15.9	9.9
10	1600	400	10.17	3140	3524	56	300	2.61	-2.41	4.83	17.2	9.2
10	1600	420	10.20	3174	3554	57	295	2.57	-2.37	4.85	17.2	9.6
10	1600	440	10.24	3202	3579	57	292	2.54	-2.34	4.83	17.3	9.9
10	1600	460	10.23	3245	3618	57	286	2.47	-2.29	4.76	17.3	10.1
10	1600	480	10.18	3307	3673	57	279	2.38	-2.21	4.68	17.2	10.2
10	1600	500	10.13	3369	3730	56	271	2.30	-2.13	4.59	17.1	10.3
10	1600	520	10.08	3425	3781	56	265	2.22	-2.06	4.50	17.0	10.3
10	1600	540	10.03	3473	3829	55	259	2.15	-2.00	4.43	16.9	10.4
10	1600	560	9.98	3529	3875	55	253	2.09	-1.94	4.35	16.9	10.5
10	1600	580	9.95	3580	3922	55	248	2.03	-1.89	4.29	16.8	10.6
10	1600	600	9.93	3632	3969	54	243	1.98	-1.84	4.23	16.8	10.6
10	1700	400	10.65	3203	3631	58	316	2.73	-2.52	4.96	18.0	9.9
10	1700	420	10.69	3241	3660	59	311	2.69	-2.48	4.94	18.1	10.2
10	1700	440	10.73	3269	3684	59	308	2.66	-2.45	4.92	18.1	10.6
10	1700	460	10.74	3310	3721	59	303	2.60	-2.40	4.87	18.1	10.8
10	1700	480	10.68	3377	3731	59	294	2.50	-2.31	4.77	18.1	10.9
10	1700	500	10.63	3437	3835	58	287	2.42	-2.24	4.69	18.0	11.0
10	1700	520	10.59	3494	3886	58	281	2.34	-2.17	4.60	17.9	11.1
10	1700	540	10.54	3549	3935	58	275	2.27	-2.10	4.53	17.8	11.1
10	1700	560	10.50	3600	3981	57	269	2.20	-2.05	4.45	17.7	11.2
10	1700	580	10.47	3655	4031	57	263	2.14	-1.99	4.39	17.7	11.3
10	1700	600	10.44	3705	4076	57	258	2.09	-1.94	4.33	17.6	11.4
10	1800	400	11.13	3273	3735	60	331	2.84	-2.62	5.03	18.8	10.5
10	1800	420	11.17	3305	3763	61	327	2.81	-2.59	5.02	18.9	10.9
10	1800	440	11.22	3331	3786	61	324	2.78	-2.56	5.01	19.0	11.3
10	1800	460	11.23	3371	3822	61	319	2.72	-2.51	4.97	19.0	11.5
10	1800	480	11.18	3439	3882	61	310	2.62	-2.42	4.87	18.9	11.6
10	1800	500	11.13	3500	3936	60	303	2.54	-2.34	4.78	18.8	11.7
10	1800	520	11.09	3559	3988	60	296	2.46	-2.27	4.70	18.7	11.8
10	1800	540	11.04	3614	4037	60	290	2.39	-2.21	4.62	18.7	11.9
10	1800	560	11.00	3666	4084	59	284	2.32	-2.15	4.55	18.6	11.9
10	1800	580	10.97	3722	4134	59	278	2.25	-2.09	4.48	18.5	12.0
10	1800	600	10.95	3773	4180	59	273	2.20	-2.04	4.43	18.5	12.1
10	1900	400	11.59	3333	3837	62	346	2.96	-2.73	5.11	19.6	11.1
10	1900	420	11.65	3364	3864	62	342	2.92	-2.69	5.09	19.7	11.5
10	1900	440	11.70	3390	3886	63	339	2.89	-2.66	5.09	19.8	11.9
10	1900	460	11.72	3423	3920	63	334	2.84	-2.62	5.05	19.8	12.2
10	1900	480	11.67	3497	3980	63	326	2.74	-2.53	4.95	19.7	12.3
10	1900	500	11.62	3559	4035	62	318	2.65	-2.45	4.87	19.6	12.4
10	1900	520	11.58	3613	4087	62	311	2.57	-2.37	4.79	19.6	12.5
10	1900	540	11.53	3675	4137	62	305	2.50	-2.31	4.71	19.5	12.6
10	1900	560	11.49	3728	4184	61	299	2.43	-2.25	4.64	19.4	12.7
10	1900	580	11.46	3784	4234	61	293	2.36	-2.19	4.57	19.4	12.7
10	1900	600	11.44	3836	4280	61	288	2.30	-2.13	4.52	19.3	12.8
10	2000	400	12.05	3390	3936	63	361	3.06	-2.82	5.17	20.4	11.8
10	2000	420	12.11	3421	3962	64	357	3.03	-2.79	5.16	20.5	12.2
10	2000	440	12.17	3445	3983	64	354	3.01	-2.77	5.16	20.6	12.6
10	2000	460	12.19	3485	4013	65	349	2.95	-2.72	5.13	20.6	12.9
10	2000	480	12.15	3552	4076	64	341	2.85	-2.63	5.04	20.5	13.0
10	2000	500	12.10	3615	4131	64	333	2.76	-2.55	4.95	20.5	13.1
10	2000	520	12.06	3675	4184	64	326	2.69	-2.49	4.87	20.4	13.2
10	2000	540	12.02	3731	4234	63	320	2.61	-2.41	4.80	20.3	13.3
10	2000	560	11.97	3788	4284	63	314	2.53	-2.34	4.72	20.2	13.4
10	2000	580	11.95	3842	4331	63	308	2.47	-2.28	4.66	20.2	13.5
10	2000	600	11.93	3894	4378	62	302	2.41	-2.23	4.60	20.2	13.6

**Figure 6-70 (Sheet 9 of 21)**

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb** **(RPK10 — Valid All Airspeeds)** **(PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
deg	ft	kn	sec	ft	ft	deg	mil	HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
15	300	400	1.64	961	1007	20	46	0.93	-0.91	2.75	2.8	0.3
15	300	420	1.57	967	1013	20	44	0.83	-0.86	2.63	2.7	0.3
15	300	440	1.51	972	1018	19	43	0.83	-0.81	2.51	2.6	0.3
15	300	460	1.45	977	1022	19	41	0.79	-0.77	2.40	2.5	0.3
15	300	480	1.40	982	1026	19	40	0.74	-0.73	2.30	2.4	0.2
15	300	500	1.34	985	1030	19	39	0.71	-0.69	2.20	2.3	0.2
15	300	520	1.29	989	1033	19	38	0.67	-0.66	2.12	2.2	0.2
15	300	540	1.25	991	1036	18	37	0.64	-0.63	2.04	2.1	0.2
15	300	560	1.21	995	1039	18	36	0.62	-0.60	1.96	2.0	0.2
15	300	580	1.17	1001	1045	18	34	0.59	-0.58	1.90	2.0	0.2
15	300	600	1.14	1007	1050	18	33	0.56	-0.55	1.83	1.9	0.2
15	400	400	2.23	1222	1286	22	59	1.07	-1.03	2.94	3.8	0.6
15	400	420	2.16	1233	1296	22	56	1.01	-0.98	2.82	3.7	0.6
15	400	440	2.09	1242	1305	21	54	0.96	-0.93	2.71	3.5	0.6
15	400	460	2.02	1252	1314	21	52	0.91	-0.93	2.59	3.4	0.6
15	400	480	1.95	1261	1323	21	49	0.86	-0.83	2.49	3.3	0.6
15	400	500	1.88	1263	1330	20	48	0.81	-0.79	2.39	3.2	0.5
15	400	520	1.82	1275	1336	20	46	0.77	-0.75	2.30	3.1	0.5
15	400	540	1.76	1281	1342	20	45	0.74	-0.72	2.21	3.0	0.5
15	400	560	1.70	1283	1349	20	43	0.71	-0.69	2.13	2.9	0.5
15	400	580	1.66	1293	1358	19	41	0.67	-0.66	2.05	2.8	0.5
15	400	600	1.61	1307	1367	19	39	0.65	-0.63	1.99	2.7	0.5
15	500	400	2.84	1454	1537	25	73	1.21	-1.16	3.12	4.8	1.0
15	500	420	2.77	1470	1552	24	70	1.15	-1.10	3.01	4.7	1.0
15	500	440	2.69	1484	1566	24	67	1.10	-1.05	2.91	4.6	1.1
15	500	460	2.61	1499	1580	23	64	1.04	-1.00	2.79	4.4	1.0
15	500	480	2.53	1513	1593	23	61	0.98	-0.95	2.68	4.3	1.0
15	500	500	2.45	1525	1605	22	58	0.93	-0.90	2.58	4.1	1.0
15	500	520	2.38	1536	1616	22	56	0.89	-0.86	2.49	4.0	1.0
15	500	540	2.31	1546	1625	22	54	0.85	-0.82	2.40	3.9	0.9
15	500	560	2.24	1557	1635	21	52	0.81	-0.78	2.32	3.8	0.9
15	500	580	2.19	1571	1649	21	50	0.77	-0.75	2.24	3.7	0.9
15	500	600	2.14	1584	1661	21	47	0.74	-0.72	2.17	3.6	0.9
15	600	400	3.45	1660	1765	27	88	1.36	-1.29	3.30	5.8	1.5
15	600	420	3.37	1680	1784	27	85	1.29	-1.24	3.20	5.7	1.6
15	600	440	3.30	1699	1802	26	81	1.24	-1.18	3.10	5.6	1.6
15	600	460	3.22	1719	1820	26	77	1.17	-1.12	2.99	5.4	1.6
15	600	480	3.13	1733	1838	25	74	1.11	-1.07	2.87	5.3	1.5
15	600	500	3.04	1755	1855	25	71	1.06	-1.01	2.77	5.1	1.5
15	600	520	2.96	1771	1870	24	68	1.01	-0.97	2.68	5.0	1.5
15	600	540	2.88	1786	1884	24	65	0.96	-0.93	2.59	4.9	1.5
15	600	560	2.82	1801	1898	23	63	0.92	-0.89	2.51	4.8	1.4
15	600	580	2.75	1819	1916	23	60	0.88	-0.85	2.43	4.7	1.4
15	600	600	2.70	1836	1931	23	57	0.85	-0.82	2.36	4.6	1.4
15	700	400	4.05	1844	1972	30	104	1.50	-1.43	3.47	6.8	2.1
15	700	420	3.98	1867	1994	30	100	1.44	-1.37	3.37	6.7	2.1
15	700	440	3.92	1883	2015	29	96	1.38	-1.31	3.28	6.6	2.2
15	700	460	3.83	1914	2038	29	92	1.31	-1.25	3.17	6.5	2.2
15	700	480	3.73	1939	2061	28	88	1.25	-1.19	3.06	6.3	2.1
15	700	500	3.64	1961	2082	27	84	1.19	-1.13	2.96	6.2	2.1
15	700	520	3.56	1981	2101	27	81	1.13	-1.08	2.86	6.0	2.1
15	700	540	3.48	2000	2119	26	78	1.08	-1.04	2.77	5.9	2.0
15	700	560	3.40	2021	2139	26	74	1.04	-0.99	2.68	5.7	2.0
15	700	580	3.34	2043	2159	25	71	1.00	-0.95	2.61	5.6	2.0
15	700	600	3.28	2063	2179	25	68	0.96	-0.92	2.54	5.5	2.0
15	800	400	4.64	2008	2151	33	120	1.64	-1.56	3.63	7.8	2.6
15	800	420	4.58	2034	2186	33	116	1.58	-1.50	3.54	7.7	2.7
15	800	440	4.52	2059	2209	32	112	1.52	-1.44	3.46	7.6	2.8
15	800	460	4.43	2088	2236	32	107	1.45	-1.38	3.35	7.5	2.8
15	800	480	4.34	2117	2263	31	102	1.38	-1.31	3.24	7.3	2.8
15	800	500	4.25	2144	2288	30	98	1.32	-1.26	3.14	7.2	2.7
15	800	520	4.16	2169	2312	30	94	1.25	-1.20	3.04	7.0	2.7
15	800	540	4.08	2192	2334	29	91	1.21	-1.15	2.95	6.9	2.7
15	800	560	3.99	2217	2357	28	87	1.16	-1.10	2.86	6.7	2.6
15	800	580	3.93	2242	2381	28	83	1.11	-1.06	2.79	6.6	2.6
15	800	600	3.87	2267	2404	28	80	1.07	-1.02	2.72	6.5	2.6

Figure 6-70 (Sheet 10 of 21)

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
15	900	400	5.22	2155	2336	36	137	1.79	-1.69	3.78	8.8	3.2
15	900	420	5.16	2185	2363	35	132	1.72	-1.63	3.69	8.7	3.3
15	900	440	5.12	2211	2387	35	128	1.67	-1.57	3.62	8.6	3.4
15	900	460	5.03	2243	2416	35	123	1.59	-1.51	3.52	8.5	3.5
15	900	480	4.94	2276	2447	34	118	1.52	-1.44	3.41	8.3	3.4
15	900	500	4.85	2307	2476	33	113	1.45	-1.38	3.31	8.2	3.4
15	900	520	4.76	2336	2504	32	109	1.39	-1.32	3.21	8.0	3.4
15	900	540	4.67	2365	2531	32	104	1.33	-1.26	3.11	7.9	3.3
15	900	560	4.59	2392	2556	31	101	1.29	-1.22	3.03	7.8	3.3
15	900	580	4.52	2421	2583	31	97	1.23	-1.17	2.96	7.6	3.3
15	900	600	4.46	2449	2609	30	93	1.19	-1.13	2.89	7.5	3.3
15	1000	400	5.79	2238	2497	39	153	1.92	-1.81	3.92	9.8	3.9
15	1000	420	5.74	2320	2526	38	148	1.86	-1.75	3.84	9.7	4.0
15	1000	440	5.70	2347	2551	38	144	1.81	-1.70	3.77	9.6	4.1
15	1000	460	5.62	2331	2583	38	139	1.73	-1.63	3.68	9.5	4.1
15	1000	480	5.52	2418	2617	37	133	1.65	-1.56	3.57	9.3	4.1
15	1000	500	5.43	2453	2649	36	128	1.58	-1.50	3.47	9.2	4.1
15	1000	520	5.35	2486	2680	35	123	1.52	-1.44	3.37	9.0	4.1
15	1000	540	5.25	2519	2710	35	119	1.45	-1.38	3.23	8.9	4.0
15	1000	560	5.17	2549	2738	34	115	1.40	-1.33	3.19	8.7	4.0
15	1000	580	5.11	2581	2768	34	110	1.35	-1.28	3.12	8.6	4.0
15	1000	600	5.05	2612	2796	33	106	1.30	-1.24	3.05	8.5	4.0
15	1100	400	6.34	2409	2649	41	169	2.06	-1.94	4.04	10.7	4.5
15	1100	420	6.30	2442	2678	41	164	2.00	-1.88	3.97	10.6	4.6
15	1100	440	6.27	2469	2703	41	160	1.94	-1.83	3.92	10.6	4.8
15	1100	460	6.19	2506	2737	41	155	1.87	-1.76	3.82	10.5	4.8
15	1100	480	6.10	2546	2774	40	149	1.79	-1.68	3.72	10.3	4.8
15	1100	500	6.01	2585	2809	39	143	1.71	-1.62	3.62	10.2	4.8
15	1100	520	5.92	2623	2845	38	138	1.64	-1.55	3.52	10.0	4.8
15	1100	540	5.83	2657	2876	38	133	1.58	-1.49	3.43	9.9	4.8
15	1100	560	5.75	2689	2906	37	129	1.52	-1.44	3.35	9.7	4.8
15	1100	580	5.69	2725	2938	37	124	1.47	-1.39	3.27	9.6	4.8
15	1100	600	5.64	2758	2969	36	120	1.42	-1.35	3.21	9.5	4.8
15	1200	400	6.88	2521	2792	44	185	2.19	-2.05	4.16	11.6	5.1
15	1200	420	6.85	2553	2821	44	180	2.13	-2.00	4.10	11.6	5.3
15	1200	440	6.82	2581	2846	44	176	2.03	-1.95	4.05	11.5	5.5
15	1200	460	6.76	2619	2881	43	171	2.00	-1.88	3.96	11.4	5.5
15	1200	480	6.66	2662	2920	43	164	1.92	-1.80	3.86	11.3	5.5
15	1200	500	6.58	2703	2958	42	158	1.84	-1.73	3.76	11.1	5.5
15	1200	520	6.49	2745	2996	41	153	1.77	-1.66	3.66	11.0	5.5
15	1200	540	6.40	2782	3030	41	148	1.70	-1.60	3.57	10.8	5.5
15	1200	560	6.32	2817	3062	40	143	1.64	-1.55	3.49	10.7	5.5
15	1200	580	6.26	2854	3096	40	139	1.59	-1.50	3.42	10.6	5.5
15	1200	600	6.21	2890	3129	39	134	1.54	-1.45	3.35	10.5	5.5
15	1300	400	7.40	2622	2926	47	201	2.32	-2.17	4.27	12.5	5.7
15	1300	420	7.38	2654	2955	47	196	2.26	-2.12	4.22	12.5	5.9
15	1300	440	7.36	2683	2981	47	192	2.21	-2.07	4.17	12.4	6.1
15	1300	460	7.31	2721	3016	46	186	2.14	-2.00	4.09	12.3	6.2
15	1300	480	7.22	2768	3058	45	180	2.05	-1.92	3.99	12.2	6.2
15	1300	500	7.13	2811	3097	45	174	1.97	-1.85	3.89	12.0	6.2
15	1300	520	7.04	2856	3138	44	168	1.89	-1.75	3.79	11.9	6.2
15	1300	540	6.96	2895	3173	43	163	1.82	-1.72	3.71	11.8	6.2
15	1300	560	6.88	2932	3207	43	158	1.75	-1.66	3.63	11.6	6.2
15	1300	580	6.82	2971	3243	42	153	1.70	-1.61	3.55	11.5	6.2
15	1300	600	6.77	3009	3278	42	148	1.65	-1.56	3.49	11.4	6.2
15	1400	400	7.92	2715	3055	49	217	2.45	-2.29	4.33	13.4	6.4
15	1400	420	7.90	2748	3084	49	212	2.39	-2.23	4.33	13.4	6.6
15	1400	440	7.90	2775	3109	49	208	2.34	-2.19	4.29	13.3	6.8
15	1400	460	7.84	2815	3144	49	202	2.27	-2.12	4.22	13.3	6.9
15	1400	480	7.76	2864	3188	48	195	2.13	-2.04	4.11	13.1	6.9
15	1400	500	7.67	2913	3232	47	189	2.03	-1.96	4.01	13.0	6.9
15	1400	520	7.58	2957	3271	47	183	2.01	-1.89	3.92	12.8	6.9
15	1400	540	7.50	2998	3309	46	177	1.94	-1.83	3.83	12.7	6.9
15	1400	560	7.43	3037	3344	46	172	1.88	-1.77	3.75	12.6	6.9
15	1400	580	7.37	3078	3381	45	167	1.82	-1.71	3.68	12.5	7.0
15	1400	600	7.32	3117	3417	45	162	1.77	-1.66	3.62	12.4	7.0

Figure 6-70 (Sheet 11 of 21)

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb** **(RPK10 — Valid All Airspeeds)** **(PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil		mil/kn		ft/kn	ft/kn
15	1500	400	8.42	2802	3178	51	233	2.57	-2.40	4.43	14.2	7.0
15	1500	420	8.42	2834	3206	51	228	2.51	-2.35	4.43	14.2	7.2
15	1500	440	8.41	2862	3231	52	224	2.47	-2.30	4.40	14.2	7.5
15	1500	460	8.37	2901	3266	51	218	2.40	-2.24	4.33	14.1	7.6
15	1500	480	8.28	2952	3311	51	211	2.30	-2.15	4.23	14.0	7.6
15	1500	500	8.20	3003	3357	50	204	2.21	-2.07	4.13	13.9	7.6
15	1500	520	8.12	3043	3393	49	198	2.13	-2.00	4.04	13.7	7.6
15	1500	540	8.04	3092	3437	49	192	2.05	-1.93	3.95	13.6	7.7
15	1500	560	7.96	3133	3474	48	187	2.00	-1.87	3.87	13.5	7.7
15	1500	580	7.91	3175	3512	46	182	1.93	-1.82	3.80	13.4	7.7
15	1500	600	7.85	3213	3551	47	177	1.88	-1.76	3.74	13.3	7.7
15	1600	400	8.91	2882	3236	53	248	2.69	-2.51	4.57	15.1	7.6
15	1600	420	8.92	2914	3324	54	243	2.64	-2.46	4.53	15.1	7.9
15	1600	440	8.92	2941	3348	54	239	2.59	-2.41	4.50	15.1	8.2
15	1600	460	8.83	2980	3383	54	234	2.52	-2.35	4.44	15.0	8.3
15	1600	480	8.80	3033	3429	53	226	2.43	-2.26	4.34	14.9	8.3
15	1600	500	8.72	3086	3476	52	219	2.33	-2.18	4.24	14.7	8.3
15	1600	520	8.64	3134	3519	52	213	2.25	-2.11	4.15	14.6	8.4
15	1600	540	8.56	3179	3559	51	207	2.18	-2.04	4.07	14.5	8.4
15	1600	560	8.49	3221	3597	51	201	2.11	-1.98	3.99	14.3	8.4
15	1600	580	8.43	3265	3636	50	196	2.05	-1.92	3.92	14.3	8.4
15	1600	600	8.38	3310	3676	50	191	1.99	-1.87	3.85	14.2	8.4
15	1700	400	9.40	2957	3411	55	263	2.81	-2.61	4.66	15.9	8.2
15	1700	420	9.41	2983	3438	56	258	2.75	-2.56	4.62	15.9	8.5
15	1700	440	9.42	3015	3462	56	254	2.71	-2.52	4.60	15.9	8.8
15	1700	460	9.39	3054	3495	56	249	2.65	-2.46	4.54	15.9	9.0
15	1700	480	9.31	3111	3545	55	241	2.54	-2.37	4.43	15.7	9.0
15	1700	500	9.23	3163	3591	55	234	2.45	-2.29	4.34	15.6	9.0
15	1700	520	9.15	3212	3634	54	227	2.37	-2.21	4.25	15.5	9.1
15	1700	540	9.07	3259	3675	54	221	2.29	-2.14	4.17	15.3	9.1
15	1700	560	9.00	3303	3715	53	216	2.22	-2.08	4.10	15.2	9.1
15	1700	580	8.95	3350	3757	53	210	2.16	-2.02	4.02	15.1	9.1
15	1700	600	8.90	3394	3796	52	205	2.10	-1.97	3.96	15.0	9.2
15	1800	400	9.87	3027	3522	57	277	2.92	-2.72	4.74	16.7	8.9
15	1800	420	9.89	3053	3543	58	273	2.87	-2.67	4.71	16.7	9.2
15	1800	440	9.91	3084	3571	58	269	2.83	-2.63	4.69	16.7	9.5
15	1800	460	9.89	3122	3603	58	264	2.77	-2.57	4.64	16.7	9.7
15	1800	480	9.80	3181	3655	57	256	2.66	-2.48	4.53	16.6	9.7
15	1800	500	9.73	3234	3701	57	249	2.57	-2.39	4.44	16.4	9.7
15	1800	520	9.65	3285	3746	56	242	2.48	-2.32	4.35	16.3	9.8
15	1800	540	9.58	3333	3788	56	236	2.41	-2.25	4.27	16.2	9.8
15	1800	560	9.51	3378	3828	55	230	2.33	-2.18	4.20	16.1	9.8
15	1800	580	9.45	3426	3870	55	224	2.27	-2.12	4.13	16.0	9.9
15	1800	600	9.40	3471	3910	54	219	2.21	-2.06	4.06	15.9	9.9
15	1900	400	10.34	3093	3630	59	292	3.03	-2.82	4.81	17.5	9.5
15	1900	420	10.36	3123	3656	59	287	2.98	-2.77	4.79	17.5	9.8
15	1900	440	10.39	3149	3679	60	284	2.94	-2.74	4.77	17.6	10.1
15	1900	460	10.38	3183	3709	60	279	2.88	-2.68	4.73	17.5	10.4
15	1900	480	10.29	3246	3761	59	270	2.73	-2.53	4.62	17.4	10.4
15	1900	500	10.22	3301	3809	59	263	2.63	-2.50	4.53	17.3	10.4
15	1900	520	10.14	3352	3853	58	256	2.50	-2.42	4.45	17.1	10.5
15	1900	540	10.07	3401	3896	58	250	2.52	-2.35	4.37	17.0	10.5
15	1900	560	10.00	3443	3937	57	244	2.44	-2.28	4.29	16.9	10.5
15	1900	580	9.95	3497	3980	57	238	2.33	-2.22	4.22	16.8	10.6
15	1900	600	9.90	3543	4021	57	233	2.31	-2.16	4.16	16.7	10.6
15	2000	400	10.80	3155	3735	61	306	3.14	-2.92	4.89	18.3	10.1
15	2000	420	10.93	3185	3751	61	302	3.09	-2.87	4.87	18.3	10.4
15	2000	440	10.96	3210	3782	62	298	3.05	-2.84	4.85	18.4	10.8
15	2000	460	10.85	3248	3814	62	293	2.99	-2.78	4.81	18.3	11.0
15	2000	480	10.78	3307	3864	61	285	2.83	-2.69	4.71	18.2	11.1
15	2000	500	10.70	3362	3912	61	277	2.80	-2.60	4.62	18.1	11.1
15	2000	520	10.63	3415	3958	60	270	2.71	-2.52	4.54	18.0	11.2
15	2000	540	10.56	3466	4001	60	264	2.63	-2.45	4.46	17.8	11.2
15	2000	560	10.49	3516	4045	59	258	2.55	-2.38	4.38	17.7	11.2
15	2000	580	10.44	3564	4086	59	252	2.48	-2.32	4.32	17.6	11.3
15	2000	600	10.39	3610	4127	59	246	2.42	-2.26	4.25	17.6	11.3

Figure 6-70 (Sheet 12 of 21)

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	IAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	900	400	4.27	1852	2059	35	106	1.85	-1.76	3.50	7.2	2.3
20	900	420	4.19	1874	2079	35	102	1.77	-1.69	3.41	7.1	2.3
20	900	440	4.12	1893	2096	35	98	1.71	-1.62	3.32	7.0	2.4
20	900	460	4.02	1914	2115	34	93	1.63	-1.55	3.21	6.8	2.4
20	900	480	3.91	1936	2135	33	89	1.55	-1.48	3.10	6.6	2.3
20	900	500	3.81	1955	2152	33	85	1.48	-1.41	2.99	6.4	2.3
20	900	520	3.72	1973	2169	32	82	1.41	-1.35	2.89	6.3	2.2
20	900	540	3.62	1991	2185	31	78	1.35	-1.29	2.80	6.1	2.2
20	900	560	3.53	2007	2200	31	75	1.29	-1.24	2.71	6.0	2.2
20	900	580	3.46	2026	2217	30	72	1.24	-1.19	2.64	5.8	2.1
20	900	600	3.39	2044	2233	30	68	1.19	-1.15	2.57	5.7	2.1
20	1000	400	4.79	1988	2226	38	120	1.98	-1.89	3.64	8.1	2.8
20	1000	420	4.71	2012	2247	37	115	1.91	-1.81	3.54	8.0	2.9
20	1000	440	4.65	2033	2265	37	111	1.84	-1.75	3.47	7.9	2.9
20	1000	460	4.55	2057	2287	36	106	1.76	-1.68	3.36	7.7	2.9
20	1000	480	4.44	2082	2310	36	101	1.68	-1.60	3.25	7.5	2.9
20	1000	500	4.34	2106	2331	35	97	1.60	-1.53	3.14	7.3	2.8
20	1000	520	4.24	2127	2351	34	93	1.53	-1.46	3.05	7.2	2.8
20	1000	540	4.13	2149	2370	34	89	1.47	-1.40	2.95	7.0	2.8
20	1000	560	4.04	2168	2387	33	86	1.41	-1.35	2.86	6.8	2.7
20	1000	580	3.97	2190	2407	33	82	1.35	-1.30	2.79	6.7	2.7
20	1000	600	3.90	2210	2426	32	78	1.31	-1.25	2.72	6.6	2.7
20	1100	400	5.30	2113	2392	40	134	2.12	-2.00	3.76	9.0	3.3
20	1100	420	5.23	2139	2405	40	129	2.04	-1.93	3.68	8.8	3.4
20	1100	440	5.17	2161	2425	39	125	1.98	-1.87	3.61	8.7	3.5
20	1100	460	5.08	2188	2449	39	120	1.90	-1.80	3.51	8.6	3.5
20	1100	480	4.97	2217	2475	38	114	1.81	-1.72	3.39	8.4	3.5
20	1100	500	4.86	2244	2499	37	109	1.73	-1.64	3.29	8.2	3.4
20	1100	520	4.75	2270	2523	37	105	1.65	-1.57	3.18	8.0	3.4
20	1100	540	4.66	2294	2544	36	101	1.59	-1.51	3.09	7.9	3.3
20	1100	560	4.56	2315	2563	35	97	1.53	-1.45	3.01	7.7	3.3
20	1100	580	4.49	2340	2586	35	93	1.47	-1.40	2.93	7.6	3.3
20	1100	600	4.41	2363	2607	34	89	1.42	-1.35	2.86	7.5	3.3
20	1200	400	5.81	2229	2531	43	148	2.25	-2.12	3.88	9.8	3.9
20	1200	420	5.75	2255	2555	42	143	2.18	-2.06	3.80	9.7	4.0
20	1200	440	5.70	2279	2575	42	138	2.11	-2.00	3.74	9.6	4.1
20	1200	460	5.61	2308	2601	41	133	2.03	-1.92	3.64	9.5	4.1
20	1200	480	5.50	2340	2630	41	127	1.94	-1.84	3.53	9.3	4.1
20	1200	500	5.39	2370	2657	40	122	1.86	-1.76	3.43	9.1	4.1
20	1200	520	5.28	2400	2693	39	117	1.78	-1.69	3.32	8.9	4.0
20	1200	540	5.18	2426	2707	38	113	1.71	-1.62	3.23	8.8	4.0
20	1200	560	5.08	2451	2729	38	109	1.64	-1.56	3.15	8.6	3.9
20	1200	580	5.01	2478	2753	37	104	1.59	-1.51	3.07	8.5	3.9
20	1200	600	4.93	2504	2777	37	100	1.53	-1.46	3.00	8.3	3.9
20	1300	400	6.31	2335	2673	45	162	2.38	-2.24	3.99	10.7	4.5
20	1300	420	6.26	2363	2697	45	157	2.31	-2.18	3.92	10.6	4.6
20	1300	440	6.21	2387	2718	44	152	2.25	-2.12	3.86	10.5	4.7
20	1300	460	6.13	2418	2745	44	147	2.16	-2.04	3.77	10.4	4.8
20	1300	480	6.02	2453	2776	43	141	2.07	-1.96	3.66	10.2	4.7
20	1300	500	5.91	2486	2806	42	135	1.98	-1.88	3.56	10.0	4.7
20	1300	520	5.80	2519	2835	42	130	1.90	-1.80	3.46	9.8	4.6
20	1300	540	5.70	2548	2861	41	125	1.83	-1.73	3.37	9.6	4.6
20	1300	560	5.60	2575	2885	40	121	1.76	-1.67	3.28	9.5	4.6
20	1300	580	5.53	2605	2911	40	116	1.70	-1.62	3.21	9.3	4.6
20	1300	600	5.45	2633	2937	39	112	1.65	-1.56	3.14	9.2	4.5
20	1400	400	6.81	2434	2808	47	176	2.50	-2.36	4.10	11.5	5.0
20	1400	420	6.76	2462	2832	47	171	2.43	-2.29	4.04	11.4	5.2
20	1400	440	6.73	2487	2854	47	166	2.38	-2.24	3.98	11.4	5.3
20	1400	460	6.65	2519	2882	46	161	2.30	-2.16	3.90	11.2	5.4
20	1400	480	6.54	2557	2915	46	154	2.20	-2.07	3.79	11.0	5.4
20	1400	500	6.42	2595	2949	45	148	2.10	-1.99	3.68	10.9	5.3
20	1400	520	6.32	2629	2978	44	143	2.02	-1.91	3.58	10.7	5.3
20	1400	540	6.22	2660	3006	43	138	1.95	-1.84	3.49	10.5	5.3
20	1400	560	6.12	2690	3032	43	133	1.88	-1.78	3.41	10.3	5.2
20	1400	580	6.04	2722	3061	42	128	1.82	-1.72	3.34	10.2	5.2
20	1400	600	5.97	2752	3088	42	124	1.76	-1.67	3.27	10.1	5.2

Figure 6-70 (Sheet 13 of 21)



# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	1500	400	7.30	2526	2938	49	190	2.63	-2.47	4.20	12.3	5.6
20	1500	420	7.26	2554	2962	49	185	2.56	-2.41	4.14	12.3	5.8
20	1500	440	7.23	2580	2984	49	180	2.50	-2.35	4.09	12.2	6.0
20	1500	460	7.16	2613	3013	49	175	2.42	-2.28	4.01	12.1	6.1
20	1500	480	7.05	2653	3048	48	168	2.32	-2.19	3.91	11.9	6.0
20	1500	500	6.93	2694	3093	47	161	2.23	-2.10	3.80	11.7	6.0
20	1500	520	6.83	2730	3115	46	156	2.14	-2.02	3.71	11.5	6.0
20	1500	540	6.73	2764	3144	46	151	2.07	-1.95	3.62	11.4	5.9
20	1500	560	6.64	2795	3172	45	146	2.00	-1.89	3.53	11.2	5.9
20	1500	580	6.56	2829	3202	45	141	1.93	-1.83	3.46	11.1	5.9
20	1500	600	6.48	2863	3232	44	136	1.87	-1.77	3.39	11.0	5.9
20	1600	400	7.78	2611	3062	51	203	2.75	-2.58	4.29	13.1	6.2
20	1600	420	7.75	2640	3097	51	198	2.68	-2.52	4.24	13.1	6.4
20	1600	440	7.73	2665	3109	51	194	2.63	-2.47	4.20	13.1	6.6
20	1600	460	7.66	2699	3137	51	189	2.55	-2.39	4.13	12.9	6.7
20	1600	480	7.55	2742	3174	50	182	2.45	-2.30	4.02	12.8	6.7
20	1600	500	7.44	2785	3212	49	175	2.35	-2.21	3.91	12.6	6.6
20	1600	520	7.34	2823	3245	49	169	2.26	-2.13	3.82	12.4	6.6
20	1600	540	7.24	2859	3276	48	163	2.18	-2.06	3.73	12.2	6.6
20	1600	560	7.14	2893	3306	48	158	2.11	-1.99	3.65	12.1	6.6
20	1600	580	7.07	2928	3337	47	153	2.05	-1.93	3.58	11.9	6.6
20	1600	600	6.99	2964	3369	46	148	1.98	-1.87	3.51	11.8	6.6
20	1700	400	8.25	2691	3193	53	217	2.86	-2.69	4.38	13.9	6.8
20	1700	420	8.23	2720	3208	53	212	2.80	-2.63	4.34	13.9	7.0
20	1700	440	8.22	2745	3229	53	208	2.75	-2.58	4.30	13.9	7.2
20	1700	460	8.16	2779	3257	53	203	2.67	-2.51	4.23	13.8	7.4
20	1700	480	8.04	2827	3298	52	195	2.56	-2.41	4.12	13.6	7.3
20	1700	500	7.94	2869	3335	52	188	2.47	-2.32	4.02	13.4	7.3
20	1700	520	7.84	2909	3370	51	182	2.38	-2.24	3.93	13.2	7.3
20	1700	540	7.74	2947	3402	50	176	2.30	-2.17	3.84	13.1	7.3
20	1700	560	7.65	2983	3433	50	171	2.23	-2.10	3.76	12.9	7.3
20	1700	580	7.56	3022	3467	49	166	2.16	-2.03	3.69	12.8	7.2
20	1700	600	7.49	3059	3499	49	160	2.09	-1.97	3.62	12.7	7.2
20	1800	400	8.72	2766	3300	55	231	2.98	-2.79	4.47	14.7	7.4
20	1800	420	8.71	2795	3324	55	226	2.92	-2.73	4.43	14.7	7.6
20	1800	440	8.70	2820	3345	55	222	2.87	-2.68	4.39	14.7	7.9
20	1800	460	8.65	2853	3373	55	216	2.79	-2.62	4.33	14.6	8.0
20	1800	480	8.54	2903	3416	55	208	2.68	-2.52	4.22	14.4	8.0
20	1800	500	8.43	2947	3454	54	202	2.59	-2.43	4.13	14.2	8.0
20	1800	520	8.33	2989	3489	53	195	2.50	-2.35	4.03	14.1	8.0
20	1800	540	8.24	3029	3523	53	189	2.41	-2.27	3.95	13.9	7.9
20	1800	560	8.14	3066	3556	52	184	2.34	-2.20	3.87	13.8	7.9
20	1800	580	8.06	3107	3591	52	178	2.27	-2.13	3.79	13.6	7.9
20	1800	600	7.99	3144	3623	51	173	2.20	-2.07	3.73	13.5	7.9
20	1900	400	9.18	2836	3413	57	244	3.09	-2.89	4.55	15.3	8.0
20	1900	420	9.17	2865	3438	57	239	3.03	-2.84	4.51	15.3	8.2
20	1900	440	9.17	2890	3458	57	235	2.98	-2.79	4.48	15.3	8.5
20	1900	460	9.13	2922	3496	57	230	2.91	-2.73	4.43	15.4	8.7
20	1900	480	9.02	2974	3529	57	222	2.80	-2.62	4.32	15.2	8.7
20	1900	500	8.92	3020	3568	56	215	2.70	-2.53	4.22	15.1	8.6
20	1900	520	8.82	3064	3605	55	208	2.61	-2.45	4.13	14.9	8.6
20	1900	540	8.72	3105	3640	55	202	2.53	-2.37	4.05	14.7	8.6
20	1900	560	8.63	3144	3674	54	197	2.45	-2.30	3.97	14.6	8.6
20	1900	580	8.55	3186	3709	54	191	2.37	-2.23	3.90	14.5	8.6
20	1900	600	8.48	3225	3743	53	185	2.31	-2.17	3.83	14.3	8.6
20	2000	400	9.64	2902	3524	59	257	3.19	-2.99	4.62	16.3	8.6
20	2000	420	9.64	2931	3548	59	252	3.14	-2.94	4.59	16.3	8.9
20	2000	440	9.64	2955	3568	59	248	3.09	-2.89	4.57	16.3	9.1
20	2000	460	9.60	2990	3597	59	243	3.02	-2.83	4.51	16.2	9.3
20	2000	480	9.50	3040	3639	58	235	2.91	-2.73	4.41	16.1	9.3
20	2000	500	9.40	3088	3679	58	228	2.81	-2.64	4.32	15.9	9.3
20	2000	520	9.30	3133	3717	57	221	2.72	-2.55	4.23	15.7	9.3
20	2000	540	9.21	3176	3753	57	215	2.64	-2.47	4.14	15.6	9.3
20	2000	560	9.11	3219	3789	56	209	2.55	-2.40	4.06	15.4	9.3
20	2000	580	9.04	3259	3824	56	203	2.48	-2.33	3.99	15.3	9.3
20	2000	600	8.97	3300	3858	55	198	2.41	-2.27	3.93	15.2	9.3

Figure 6-70 (Sheet 14 of 21)

## Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
20	2100	400	10.09	2964	3633	60	270	3.30	-3.09	4.69	17.0	9.2
20	2100	420	10.09	2943	3656	61	265	3.25	-3.03	4.66	17.1	9.5
20	2100	440	10.10	2917	3676	61	262	3.20	-2.99	4.64	17.1	9.8
20	2100	460	10.08	3050	3703	61	256	3.14	-2.93	4.60	17.0	10.0
20	2100	480	9.97	3102	3746	60	248	3.03	-2.93	4.50	16.9	10.0
20	2100	500	9.87	3152	3787	60	241	2.92	-2.74	4.40	16.7	10.0
20	2100	520	9.78	3193	3826	59	234	2.83	-2.65	4.32	16.5	10.0
20	2100	540	9.68	3242	3863	59	228	2.74	-2.57	4.24	16.4	10.0
20	2100	560	9.59	3286	3900	58	222	2.65	-2.49	4.16	16.2	10.0
20	2100	580	9.51	3328	3935	58	216	2.59	-2.43	4.09	16.1	10.0
20	2100	600	9.45	3370	3970	57	210	2.52	-2.36	4.02	16.0	10.0
20	2200	400	10.53	3023	3739	62	283	3.40	-3.18	4.76	17.8	9.7
20	2200	420	10.54	3051	3762	62	278	3.35	-3.13	4.74	17.8	10.1
20	2200	440	10.56	3075	3781	62	275	3.31	-3.09	4.72	17.8	10.4
20	2200	460	10.54	3107	3807	63	270	3.25	-3.03	4.63	17.8	10.6
20	2200	480	10.44	3161	3851	62	261	3.13	-2.93	4.58	17.6	10.6
20	2200	500	10.34	3211	3893	61	254	3.03	-2.83	4.49	17.5	10.6
20	2200	520	10.25	3259	3932	61	247	2.94	-2.75	4.40	17.3	10.6
20	2200	540	10.15	3305	3970	60	241	2.85	-2.67	4.32	17.2	10.6
20	2200	560	10.06	3349	4007	60	234	2.76	-2.59	4.24	17.0	10.6
20	2200	580	9.99	3393	4043	59	228	2.69	-2.52	4.17	16.9	10.7
20	2200	600	9.92	3435	4079	59	223	2.62	-2.46	4.11	16.8	10.7
20	2300	400	10.37	3079	3843	63	295	3.50	-3.27	4.82	18.5	10.3
20	2300	420	10.39	3106	3865	64	291	3.45	-3.22	4.80	18.6	10.7
20	2300	440	11.01	3132	3886	64	287	3.41	-3.18	4.79	18.6	11.0
20	2300	460	11.00	3161	3909	64	282	3.35	-3.13	4.76	18.6	11.3
20	2300	480	10.90	3215	3953	64	274	3.24	-3.03	4.66	18.4	11.3
20	2300	500	10.80	3267	3996	63	267	3.14	-2.93	4.57	18.3	11.3
20	2300	520	10.71	3316	4036	63	260	3.04	-2.84	4.48	18.1	11.3
20	2300	540	10.62	3365	4076	62	253	2.95	-2.76	4.40	17.9	11.3
20	2300	560	10.53	3409	4112	62	247	2.87	-2.68	4.33	17.8	11.3
20	2300	580	10.45	3453	4149	61	241	2.79	-2.61	4.26	17.7	11.3
20	2300	600	10.39	3496	4185	61	235	2.72	-2.55	4.19	17.6	11.4
20	2400	400	11.40	3132	3946	65	307	3.59	-3.36	4.88	19.3	10.9
20	2400	420	11.42	3159	3967	65	303	3.55	-3.31	4.87	19.3	11.3
20	2400	440	11.45	3184	3988	65	299	3.51	-3.27	4.85	19.4	11.6
20	2400	460	11.46	3211	4009	66	295	3.46	-3.22	4.83	19.4	11.9
20	2400	480	11.36	3267	4054	65	287	3.34	-3.12	4.73	19.2	12.0
20	2400	500	11.26	3320	4097	65	279	3.24	-3.02	4.65	19.0	12.0
20	2400	520	11.17	3370	4137	64	272	3.14	-2.94	4.56	18.9	12.0
20	2400	540	11.08	3420	4178	64	265	3.05	-2.85	4.48	18.7	12.0
20	2400	560	10.99	3465	4215	63	259	2.97	-2.78	4.41	18.6	12.0
20	2400	580	10.91	3510	4252	63	253	2.89	-2.70	4.34	18.4	12.0
20	2400	600	10.85	3554	4288	62	247	2.82	-2.64	4.28	18.3	12.0
20	2500	400	11.83	3182	4047	66	319	3.69	-3.44	4.94	20.0	11.5
20	2500	420	11.85	3209	4068	66	315	3.64	-3.40	4.93	20.0	11.9
20	2500	440	11.89	3234	4087	67	312	3.60	-3.36	4.92	20.1	12.3
20	2500	460	11.91	3259	4107	67	308	3.56	-3.32	4.90	20.1	12.6
20	2500	480	11.81	3316	4152	66	299	3.45	-3.21	4.81	20.0	12.6
20	2500	500	11.71	3370	4196	66	292	3.34	-3.12	4.72	19.8	12.6
20	2500	520	11.62	3421	4237	66	284	3.24	-3.03	4.64	19.6	12.6
20	2500	540	11.53	3471	4278	65	277	3.15	-2.94	4.55	19.5	12.6
20	2500	560	11.44	3519	4316	65	271	3.06	-2.86	4.48	19.3	12.7
20	2500	580	11.37	3563	4353	64	265	2.99	-2.79	4.41	19.2	12.7
20	2500	600	11.31	3608	4390	64	259	2.91	-2.73	4.35	19.1	12.7
20	2600	400	12.25	3231	4147	67	331	3.78	-3.52	4.99	20.7	12.1
20	2600	420	12.29	3256	4167	68	327	3.74	-3.48	4.98	20.8	12.5
20	2600	440	12.33	3281	4186	68	324	3.70	-3.45	4.98	20.8	12.9
20	2600	460	12.36	3303	4204	68	320	3.66	-3.41	4.97	20.9	13.2
20	2600	480	12.26	3362	4250	68	312	3.54	-3.30	4.87	20.7	13.3
20	2600	500	12.16	3417	4293	67	304	3.44	-3.21	4.79	20.6	13.3
20	2600	520	12.07	3471	4337	67	296	3.34	-3.11	4.70	20.4	13.3
20	2600	540	11.98	3520	4376	67	289	3.24	-3.03	4.63	20.2	13.3
20	2600	560	11.90	3567	4414	66	283	3.16	-2.95	4.55	20.1	13.3
20	2600	580	11.82	3614	4452	66	277	3.03	-2.88	4.49	20.0	13.3
20	2600	600	11.76	3660	4489	65	271	3.01	-2.81	4.43	19.9	13.4

**Figure 6-70 (Sheet 15 of 21)**

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb** **(RPK10 — Valid All Airspeeds)** **(PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil			mil/kn	ft/kn	ft/kn
25	900	400	3.54	1582	1820	37	84	1.91	-1.83	3.29	6.0	1.6
25	900	420	3.45	1596	1833	36	80	1.82	-1.75	3.18	5.8	1.6
25	900	440	3.37	1609	1844	36	77	1.75	-1.68	3.08	5.7	1.7
25	900	460	3.26	1623	1856	35	73	1.65	-1.60	2.97	5.5	1.6
25	900	480	3.16	1636	1867	35	70	1.58	-1.52	2.86	5.3	1.6
25	900	500	3.06	1649	1878	34	67	1.51	-1.45	2.75	5.2	1.5
25	900	520	2.97	1659	1887	34	64	1.44	-1.39	2.66	5.0	1.5
25	900	540	2.87	1669	1896	33	61	1.37	-1.32	2.56	4.9	1.4
25	900	560	2.79	1679	1904	33	59	1.32	-1.27	2.48	4.7	1.4
25	900	580	2.72	1690	1915	32	56	1.26	-1.22	2.40	4.6	1.4
25	900	600	2.65	1701	1925	32	53	1.22	-1.18	2.33	4.5	1.4
25	1000	400	4.00	1713	1933	38	95	2.04	-1.95	3.41	6.8	2.0
25	1000	420	3.91	1730	1946	38	91	1.95	-1.87	3.31	6.6	2.1
25	1000	440	3.83	1744	2011	38	87	1.89	-1.80	3.22	6.5	2.1
25	1000	460	3.73	1761	2025	37	83	1.79	-1.72	3.11	6.3	2.1
25	1000	480	3.61	1777	2039	36	79	1.70	-1.63	2.99	6.1	2.0
25	1000	500	3.51	1792	2052	36	76	1.63	-1.56	2.89	5.9	2.0
25	1000	520	3.41	1805	2064	35	72	1.55	-1.49	2.79	5.8	1.9
25	1000	540	3.31	1819	2075	35	69	1.48	-1.43	2.69	5.6	1.9
25	1000	560	3.22	1830	2085	34	67	1.42	-1.37	2.61	5.4	1.8
25	1000	580	3.14	1844	2098	34	63	1.37	-1.32	2.53	5.3	1.8
25	1000	600	3.07	1857	2109	33	60	1.32	-1.27	2.46	5.2	1.8
25	1100	400	4.47	1835	2140	40	107	2.17	-2.07	3.53	7.5	2.5
25	1100	420	4.38	1854	2156	40	102	2.08	-1.99	3.43	7.4	2.5
25	1100	440	4.30	1871	2170	40	98	2.01	-1.92	3.35	7.3	2.6
25	1100	460	4.20	1890	2186	39	94	1.92	-1.83	3.24	7.1	2.6
25	1100	480	4.08	1909	2203	38	89	1.83	-1.75	3.13	6.9	2.5
25	1100	500	3.97	1927	2219	38	85	1.75	-1.67	3.02	6.7	2.5
25	1100	520	3.86	1944	2234	37	81	1.66	-1.59	2.92	6.5	2.4
25	1100	540	3.76	1959	2246	36	78	1.60	-1.53	2.82	6.3	2.3
25	1100	560	3.66	1973	2259	36	75	1.53	-1.47	2.74	6.2	2.3
25	1100	580	3.58	1989	2273	35	71	1.47	-1.42	2.66	6.1	2.3
25	1100	600	3.50	2005	2287	35	68	1.42	-1.36	2.59	5.9	2.2
25	1200	400	4.93	1950	2290	42	118	2.29	-2.18	3.64	8.3	3.0
25	1200	420	4.85	1970	2307	42	114	2.21	-2.10	3.55	8.2	3.0
25	1200	440	4.78	1989	2323	42	109	2.14	-2.04	3.47	8.1	3.1
25	1200	460	4.67	2010	2341	41	105	2.05	-1.95	3.37	7.9	3.1
25	1200	480	4.55	2032	2360	40	100	1.96	-1.86	3.26	7.7	3.0
25	1200	500	4.44	2053	2378	40	95	1.87	-1.78	3.15	7.5	3.0
25	1200	520	4.32	2073	2395	39	91	1.78	-1.70	3.05	7.3	2.9
25	1200	540	4.21	2090	2410	38	87	1.71	-1.64	2.95	7.1	2.8
25	1200	560	4.11	2106	2424	38	84	1.64	-1.57	2.87	7.0	2.8
25	1200	580	4.03	2125	2441	37	80	1.58	-1.52	2.79	6.8	2.8
25	1200	600	3.95	2143	2456	37	76	1.53	-1.46	2.72	6.7	2.7
25	1300	400	5.40	2057	2434	44	130	2.42	-2.30	3.75	9.1	3.4
25	1300	420	5.32	2079	2452	44	125	2.34	-2.22	3.67	9.0	3.5
25	1300	440	5.25	2098	2468	44	121	2.27	-2.15	3.60	8.9	3.6
25	1300	460	5.15	2121	2488	43	116	2.18	-2.07	3.50	8.7	3.6
25	1300	480	5.03	2147	2510	42	111	2.08	-1.98	3.38	8.5	3.6
25	1300	500	4.91	2170	2530	42	106	1.99	-1.90	3.28	8.3	3.5
25	1300	520	4.79	2193	2550	41	101	1.90	-1.81	3.17	8.1	3.4
25	1300	540	4.68	2213	2567	40	97	1.83	-1.74	3.08	7.9	3.4
25	1300	560	4.58	2232	2583	40	94	1.76	-1.68	2.99	7.7	3.3
25	1300	580	4.49	2253	2601	39	89	1.69	-1.62	2.92	7.6	3.3
25	1300	600	4.41	2273	2619	39	85	1.64	-1.56	2.84	7.4	3.3
25	1400	400	5.86	2157	2572	46	142	2.54	-2.41	3.85	9.9	4.0
25	1400	420	5.79	2180	2591	46	137	2.47	-2.34	3.78	9.8	4.1
25	1400	440	5.73	2201	2608	46	133	2.40	-2.27	3.71	9.7	4.2
25	1400	460	5.63	2225	2629	45	128	2.31	-2.19	3.62	9.5	4.2
25	1400	480	5.51	2254	2653	44	122	2.21	-2.10	3.51	9.3	4.1
25	1400	500	5.38	2281	2677	44	117	2.11	-2.00	3.39	9.1	4.1
25	1400	520	5.26	2306	2697	43	112	2.02	-1.92	3.30	8.9	4.0
25	1400	540	5.15	2328	2717	42	107	1.94	-1.85	3.20	8.7	3.9
25	1400	560	5.05	2349	2735	42	103	1.87	-1.78	3.12	8.5	3.9
25	1400	580	4.96	2372	2755	41	99	1.81	-1.72	3.04	8.4	3.9
25	1400	600	4.87	2395	2774	41	95	1.75	-1.67	2.97	8.2	3.8

Figure 6-70 (Sheet 16 of 21)

## Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
25	1500	400	6.33	2251	2705	48	154	2.67	-2.52	3.95	10.7	4.5
25	1500	420	6.26	2275	2725	49	149	2.59	-2.45	3.88	10.6	4.6
25	1500	440	6.21	2296	2743	49	145	2.52	-2.39	3.82	10.5	4.7
25	1500	460	6.11	2322	2765	47	140	2.44	-2.31	3.74	10.3	4.8
25	1500	480	5.99	2353	2791	47	134	2.33	-2.21	3.62	10.1	4.7
25	1500	500	5.86	2384	2816	46	128	2.23	-2.12	3.51	9.9	4.6
25	1500	520	5.74	2410	2839	45	123	2.14	-2.03	3.41	9.7	4.6
25	1500	540	5.63	2435	2860	44	118	2.06	-1.96	3.32	9.5	4.5
25	1500	560	5.52	2459	2880	44	114	1.99	-1.89	3.24	9.3	4.5
25	1500	580	5.43	2484	2902	43	109	1.92	-1.83	3.16	9.2	4.4
25	1500	600	5.34	2509	2923	43	105	1.85	-1.77	3.08	9.0	4.4
25	1600	400	6.79	2339	2833	50	166	2.79	-2.63	4.05	11.5	5.0
25	1600	420	6.73	2363	2854	50	161	2.71	-2.56	3.93	11.4	5.2
25	1600	440	6.68	2385	2872	50	157	2.65	-2.50	3.93	11.3	5.3
25	1600	460	6.59	2412	2895	49	152	2.56	-2.42	3.85	11.1	5.4
25	1600	480	6.46	2446	2923	49	145	2.45	-2.32	3.74	10.9	5.3
25	1600	500	6.33	2479	2950	48	139	2.35	-2.23	3.63	10.7	5.2
25	1600	520	6.21	2508	2975	47	134	2.26	-2.14	3.53	10.5	5.2
25	1600	540	6.10	2535	2998	46	129	2.13	-2.07	3.44	10.3	5.1
25	1600	560	5.99	2561	3019	46	124	2.10	-2.00	3.35	10.1	5.1
25	1600	580	5.90	2588	3043	45	120	2.03	-1.93	3.28	10.0	5.0
25	1600	600	5.81	2615	3066	45	115	1.96	-1.87	3.20	9.8	5.0
25	1700	400	7.24	2421	2958	52	179	2.90	-2.74	4.14	12.2	5.6
25	1700	420	7.19	2446	2979	52	174	2.83	-2.67	4.08	12.2	5.7
25	1700	440	7.15	2469	2997	52	169	2.77	-2.61	4.03	12.1	5.9
25	1700	460	7.07	2496	3020	52	164	2.69	-2.54	3.95	11.9	6.0
25	1700	480	6.93	2534	3052	51	157	2.57	-2.43	3.84	11.7	5.9
25	1700	500	6.81	2568	3080	50	151	2.47	-2.34	3.74	11.5	5.8
25	1700	520	6.69	2599	3106	49	145	2.38	-2.25	3.64	11.3	5.8
25	1700	540	6.58	2628	3130	49	140	2.29	-2.17	3.55	11.1	5.7
25	1700	560	6.47	2656	3153	48	135	2.21	-2.10	3.47	10.9	5.7
25	1700	580	6.37	2686	3179	47	130	2.14	-2.03	3.39	10.8	5.7
25	1700	600	6.28	2714	3203	47	125	2.07	-1.97	3.31	10.6	5.6
25	1800	400	7.69	2493	3079	54	191	3.02	-2.84	4.22	13.0	6.1
25	1800	420	7.65	2524	3100	54	186	2.95	-2.78	4.17	12.9	6.3
25	1800	440	7.61	2547	3119	54	181	2.89	-2.72	4.13	12.9	6.5
25	1800	460	7.54	2575	3142	54	176	2.81	-2.65	4.06	12.7	6.6
25	1800	480	7.41	2615	3175	53	169	2.69	-2.54	3.94	12.5	6.5
25	1800	500	7.28	2651	3204	52	163	2.59	-2.44	3.84	12.3	6.5
25	1800	520	7.16	2684	3232	51	157	2.49	-2.36	3.75	12.1	6.4
25	1800	540	7.05	2715	3258	51	151	2.41	-2.28	3.66	11.9	6.4
25	1800	560	6.94	2745	3282	50	146	2.33	-2.20	3.57	11.7	6.3
25	1800	580	6.84	2777	3309	49	141	2.25	-2.13	3.49	11.6	6.3
25	1800	600	6.75	2807	3334	49	136	2.18	-2.07	3.42	11.4	6.3
25	1900	400	8.14	2571	3197	56	203	3.13	-2.95	4.30	13.8	6.7
25	1900	420	8.11	2597	3218	56	198	3.06	-2.88	4.26	13.7	6.9
25	1900	440	8.08	2620	3236	56	194	3.00	-2.83	4.22	13.6	7.1
25	1900	460	8.01	2648	3259	55	188	2.93	-2.76	4.15	13.5	7.2
25	1900	480	7.88	2691	3294	55	181	2.81	-2.65	4.04	13.3	7.1
25	1900	500	7.75	2728	3325	54	174	2.70	-2.55	3.94	13.1	7.1
25	1900	520	7.63	2763	3354	53	168	2.61	-2.46	3.85	12.9	7.0
25	1900	540	7.52	2797	3381	53	163	2.52	-2.38	3.76	12.7	7.0
25	1900	560	7.41	2828	3407	52	157	2.44	-2.31	3.68	12.5	7.0
25	1900	580	7.31	2861	3435	51	152	2.36	-2.23	3.60	12.4	6.9
25	1900	600	7.22	2893	3461	51	147	2.29	-2.17	3.53	12.2	6.9
25	2000	400	8.59	2640	3312	57	215	3.23	-3.05	4.38	14.5	7.2
25	2000	420	8.56	2666	3333	57	210	3.17	-2.98	4.34	14.5	7.5
25	2000	440	8.53	2689	3351	57	206	3.11	-2.93	4.30	14.4	7.7
25	2000	460	8.47	2719	3376	57	200	3.04	-2.86	4.24	14.3	7.8
25	2000	480	8.34	2761	3409	57	193	2.92	-2.75	4.14	14.1	7.8
25	2000	500	8.22	2801	3441	56	186	2.82	-2.65	4.04	13.9	7.7
25	2000	520	8.10	2838	3472	55	180	2.72	-2.56	3.94	13.7	7.7
25	2000	540	7.99	2873	3500	55	174	2.63	-2.48	3.86	13.5	7.6
25	2000	560	7.87	2907	3528	54	168	2.54	-2.40	3.77	13.3	7.6
25	2000	580	7.78	2941	3556	53	163	2.47	-2.33	3.70	13.1	7.6
25	2000	600	7.69	2974	3584	53	158	2.40	-2.27	3.63	13.0	7.5

**Figure 6-70 (Sheet 17 of 21)**

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb** **(RPK10 — Valid All Airspeeds)** **(PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
25	2100	400	9.02	2705	3424	59	226	3.34	-3.14	4.45	15.3	7.8
25	2100	420	9.00	2731	3445	59	222	3.29	-3.08	4.42	15.2	8.0
25	2100	440	8.99	2754	3463	59	218	3.22	-3.03	4.39	15.2	8.3
25	2100	460	8.93	2784	3497	59	212	3.15	-2.96	4.33	15.1	8.4
25	2100	480	8.81	2827	3522	58	205	3.03	-2.85	4.23	14.9	8.4
25	2100	500	8.68	2859	3555	58	198	2.93	-2.76	4.13	14.7	8.3
25	2100	520	8.57	2907	3586	57	191	2.83	-2.66	4.04	14.5	8.3
25	2100	540	8.45	2944	3616	56	185	2.74	-2.58	3.95	14.3	8.3
25	2100	560	8.34	2990	3645	56	180	2.65	-2.50	3.87	14.1	8.2
25	2100	580	8.24	3015	3674	55	174	2.57	-2.43	3.79	13.9	8.2
25	2100	600	8.16	3049	3702	55	169	2.50	-2.36	3.72	13.8	8.2
25	2200	400	9.46	2766	3534	60	238	3.44	-3.24	4.52	16.0	8.4
25	2200	420	9.44	2792	3555	61	233	3.38	-3.18	4.49	16.0	8.6
25	2200	440	9.44	2815	3573	61	230	3.33	-3.13	4.46	15.9	8.9
25	2200	460	9.39	2844	3596	61	224	3.26	-3.06	4.41	15.7	9.0
25	2200	480	9.27	2890	3632	60	217	3.14	-2.95	4.31	15.7	9.0
25	2200	500	9.14	2932	3666	59	210	3.03	-2.86	4.21	15.5	9.0
25	2200	520	9.03	2973	3698	59	203	2.93	-2.76	4.12	15.3	8.9
25	2200	540	8.91	3010	3729	59	197	2.84	-2.68	4.04	15.1	8.9
25	2200	560	8.80	3048	3759	58	191	2.75	-2.60	3.96	14.9	8.9
25	2200	580	8.71	3084	3788	57	185	2.68	-2.52	3.88	14.7	8.8
25	2200	600	8.62	3120	3818	57	180	2.60	-2.46	3.82	14.6	8.8
25	2300	400	9.89	2825	3643	62	250	3.54	-3.33	4.59	16.7	8.9
25	2300	420	9.86	2851	3663	62	245	3.48	-3.27	4.56	16.7	9.2
25	2300	440	9.87	2875	3682	62	241	3.43	-3.22	4.53	16.7	9.5
25	2300	460	9.85	2901	3702	62	236	3.37	-3.16	4.49	16.6	9.7
25	2300	480	9.72	2948	3739	62	229	3.25	-3.05	4.39	16.4	9.7
25	2300	500	9.60	2992	3774	61	221	3.14	-2.95	4.30	16.2	9.6
25	2300	520	9.48	3034	3807	60	215	3.04	-2.86	4.21	16.0	9.6
25	2300	540	9.37	3075	3840	60	208	2.94	-2.77	4.12	15.8	9.5
25	2300	560	9.26	3112	3870	59	202	2.86	-2.69	4.04	15.6	9.5
25	2300	580	9.16	3149	3900	59	197	2.78	-2.62	3.97	15.5	9.5
25	2300	600	9.08	3186	3930	58	191	2.70	-2.55	3.90	15.3	9.5
25	2400	400	10.32	2880	3749	63	261	3.64	-3.42	4.65	17.4	9.5
25	2400	420	10.32	2906	3769	63	257	3.58	-3.36	4.63	17.4	9.8
25	2400	440	10.32	2930	3787	64	252	3.53	-3.31	4.60	17.4	10.1
25	2400	460	10.30	2955	3807	64	248	3.47	-3.26	4.57	17.4	10.3
25	2400	480	10.17	3003	3844	63	240	3.35	-3.15	4.47	17.2	10.3
25	2400	500	10.05	3049	3880	63	233	3.24	-3.05	4.38	17.0	10.3
25	2400	520	9.94	3092	3914	62	226	3.14	-2.95	4.29	16.8	10.2
25	2400	540	9.82	3134	3947	61	219	3.04	-2.86	4.20	16.6	10.2
25	2400	560	9.71	3172	3978	61	213	2.96	-2.78	4.13	16.4	10.2
25	2400	580	9.62	3211	4009	60	208	2.88	-2.71	4.05	16.3	10.1
25	2400	600	9.53	3249	4039	60	202	2.80	-2.64	3.99	16.1	10.1
25	2500	400	10.74	2932	3853	65	272	3.73	-3.50	4.71	18.1	10.1
25	2500	420	10.75	2958	3873	65	268	3.67	-3.45	4.69	18.2	10.4
25	2500	440	10.75	2982	3891	65	264	3.63	-3.40	4.67	18.2	10.7
25	2500	460	10.74	3005	3909	65	260	3.58	-3.35	4.64	18.2	10.9
25	2500	480	10.62	3055	3948	65	252	3.46	-3.24	4.55	17.9	10.9
25	2500	500	10.50	3102	3984	64	244	3.34	-3.14	4.45	17.7	10.9
25	2500	520	10.39	3146	4018	64	237	3.24	-3.05	4.37	17.6	10.9
25	2500	540	10.27	3190	4053	63	231	3.14	-2.96	4.28	17.4	10.8
25	2500	560	10.16	3229	4084	62	225	3.06	-2.88	4.21	17.2	10.8
25	2500	580	10.07	3269	4115	62	219	2.97	-2.80	4.13	17.0	10.8
25	2500	600	9.99	3308	4146	62	213	2.90	-2.73	4.07	16.9	10.8
25	2600	400	11.16	2983	3957	66	283	3.82	-3.58	4.77	18.9	10.6
25	2600	420	11.17	3008	3976	66	279	3.77	-3.53	4.75	18.9	11.0
25	2600	440	11.18	3031	3993	66	275	3.72	-3.49	4.73	18.9	11.3
25	2600	460	11.19	3053	4010	67	271	3.68	-3.45	4.71	18.9	11.6
25	2600	480	11.06	3104	4049	66	263	3.55	-3.33	4.62	18.7	11.6
25	2600	500	10.95	3152	4086	65	256	3.44	-3.23	4.53	18.5	11.5
25	2600	520	10.83	3199	4123	65	248	3.34	-3.13	4.44	18.3	11.5
25	2600	540	10.72	3242	4156	64	242	3.24	-3.05	4.36	18.1	11.5
25	2600	560	10.61	3283	4188	64	236	3.15	-2.96	4.28	17.9	11.5
25	2600	580	10.52	3323	4220	64	230	3.07	-2.89	4.21	17.8	11.5
25	2600	600	10.43	3363	4251	63	224	2.99	-2.82	4.15	17.6	11.4

Figure 6-70 (Sheet 18 of 21)

## Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	900	400	2.99	1349	1622	39	68	1.98	-1.91	3.12	5.1	1.2
30	900	420	2.90	1358	1629	38	65	1.88	-1.82	3.01	4.9	1.2
30	900	440	2.81	1367	1636	38	62	1.80	-1.74	2.91	4.8	1.2
30	900	460	2.72	1375	1643	38	59	1.72	-1.66	2.79	4.6	1.1
30	900	480	2.62	1383	1650	37	57	1.63	-1.58	2.68	4.4	1.1
30	900	500	2.53	1390	1656	37	54	1.55	-1.51	2.58	4.3	1.1
30	900	520	2.44	1396	1661	36	52	1.48	-1.44	2.48	4.1	1.0
30	900	540	2.36	1402	1666	36	50	1.42	-1.38	2.39	4.0	1.0
30	900	560	2.28	1408	1671	36	48	1.36	-1.32	2.31	3.9	1.0
30	900	580	2.22	1415	1677	35	46	1.31	-1.27	2.23	3.7	0.9
30	900	600	2.16	1422	1683	35	44	1.26	-1.22	2.16	3.6	0.9
30	1000	400	3.40	1470	1778	40	77	2.10	-2.02	3.23	5.7	1.5
30	1000	420	3.30	1482	1787	40	73	2.00	-1.93	3.12	5.6	1.5
30	1000	440	3.21	1492	1796	39	70	1.92	-1.85	3.02	5.4	1.5
30	1000	460	3.11	1502	1805	39	67	1.83	-1.77	2.91	5.3	1.5
30	1000	480	3.01	1512	1813	38	64	1.74	-1.68	2.80	5.1	1.4
30	1000	500	2.91	1521	1821	38	61	1.66	-1.60	2.70	4.9	1.4
30	1000	520	2.81	1530	1827	38	58	1.59	-1.54	2.60	4.8	1.4
30	1000	540	2.72	1537	1834	37	56	1.52	-1.47	2.50	4.6	1.3
30	1000	560	2.64	1544	1840	37	54	1.45	-1.41	2.42	4.5	1.3
30	1000	580	2.56	1554	1848	36	51	1.40	-1.36	2.34	4.3	1.2
30	1000	600	2.50	1562	1855	36	49	1.34	-1.31	2.27	4.2	1.2
30	1100	400	3.81	1585	1929	42	86	2.22	-2.13	3.34	6.4	1.9
30	1100	420	3.72	1598	1940	41	82	2.12	-2.04	3.23	6.3	1.9
30	1100	440	3.63	1610	1950	41	79	2.04	-1.96	3.14	6.1	1.9
30	1100	460	3.52	1623	1960	41	75	1.95	-1.88	3.03	6.0	1.9
30	1100	480	3.41	1635	1971	40	71	1.86	-1.79	2.92	5.8	1.8
30	1100	500	3.30	1647	1980	39	68	1.77	-1.71	2.81	5.6	1.8
30	1100	520	3.19	1657	1989	39	65	1.69	-1.63	2.71	5.4	1.7
30	1100	540	3.10	1667	1997	38	63	1.62	-1.56	2.62	5.2	1.7
30	1100	560	3.01	1675	2004	38	60	1.55	-1.50	2.53	5.1	1.6
30	1100	580	2.93	1686	2013	38	57	1.49	-1.44	2.46	4.9	1.6
30	1100	600	2.86	1696	2022	37	54	1.44	-1.39	2.39	4.8	1.6
30	1200	400	4.23	1694	2076	44	96	2.34	-2.24	3.44	7.1	2.3
30	1200	420	4.14	1709	2088	43	91	2.25	-2.15	3.35	7.0	2.3
30	1200	440	4.05	1722	2099	43	88	2.17	-2.08	3.26	6.8	2.3
30	1200	460	3.94	1737	2111	42	84	2.07	-1.99	3.15	6.7	2.3
30	1200	480	3.82	1752	2124	41	80	1.97	-1.90	3.04	6.5	2.2
30	1200	500	3.71	1766	2135	41	76	1.89	-1.81	2.93	6.3	2.2
30	1200	520	3.59	1779	2146	40	73	1.80	-1.73	2.83	6.1	2.1
30	1200	540	3.49	1790	2155	40	70	1.72	-1.66	2.74	5.9	2.1
30	1200	560	3.39	1800	2164	39	67	1.66	-1.60	2.65	5.7	2.0
30	1200	580	3.31	1813	2174	39	64	1.59	-1.54	2.57	5.6	2.0
30	1200	600	3.23	1825	2184	39	61	1.53	-1.48	2.50	5.5	1.9
30	1300	400	4.65	1797	2218	45	105	2.46	-2.35	3.54	7.9	2.7
30	1300	420	4.56	1814	2232	45	101	2.37	-2.26	3.45	7.7	2.7
30	1300	440	4.48	1829	2244	44	97	2.29	-2.19	3.37	7.6	2.8
30	1300	460	4.37	1845	2257	44	93	2.20	-2.10	3.27	7.4	2.8
30	1300	480	4.24	1863	2271	43	88	2.09	-2.00	3.16	7.2	2.7
30	1300	500	4.12	1878	2284	42	84	2.00	-1.92	3.05	7.0	2.6
30	1300	520	4.00	1894	2297	42	81	1.91	-1.83	2.94	6.8	2.6
30	1300	540	3.89	1907	2308	41	77	1.83	-1.76	2.85	6.6	2.5
30	1300	560	3.79	1919	2318	41	74	1.76	-1.69	2.76	6.4	2.5
30	1300	580	3.70	1934	2330	40	71	1.70	-1.63	2.69	6.3	2.4
30	1300	600	3.62	1948	2342	40	67	1.64	-1.57	2.61	6.1	2.4
30	1400	400	5.08	1895	2356	47	116	2.58	-2.46	3.64	8.6	3.1
30	1400	420	4.99	1913	2370	46	111	2.49	-2.38	3.56	8.4	3.2
30	1400	440	4.91	1929	2383	46	107	2.41	-2.30	3.48	8.3	3.2
30	1400	460	4.81	1947	2398	46	102	2.32	-2.21	3.39	8.1	3.2
30	1400	480	4.67	1967	2414	45	98	2.21	-2.12	3.27	7.9	3.2
30	1400	500	4.54	1986	2430	44	93	2.11	-2.02	3.16	7.7	3.1
30	1400	520	4.42	2003	2444	44	89	2.02	-1.94	3.06	7.5	3.0
30	1400	540	4.31	2018	2456	43	85	1.94	-1.86	2.97	7.3	3.0
30	1400	560	4.20	2033	2468	42	82	1.87	-1.79	2.88	7.1	2.9
30	1400	580	4.11	2049	2482	42	78	1.80	-1.73	2.80	6.9	2.9
30	1400	600	4.02	2065	2495	41	75	1.74	-1.67	2.73	6.8	2.8

**Figure 6-70 (Sheet 19 of 21)**

# **Ballistic Table — MK82 High Drag (Snakeye 1) Bomb** **(RPK10 — Valid All Airspeeds)** **(PM-3 — Valid Above 475 KEAS)**

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	1500	400	5.51	1987	2489	49	126	2.70	-2.57	3.74	9.3	3.6
30	1500	420	5.43	2006	2505	48	121	2.61	-2.49	3.66	9.2	3.7
30	1500	440	5.35	2023	2518	48	117	2.54	-2.41	3.59	9.0	3.7
30	1500	460	5.25	2043	2534	47	112	2.44	-2.33	3.50	8.9	3.7
30	1500	480	5.11	2065	2552	47	107	2.33	-2.23	3.33	8.6	3.7
30	1500	500	4.97	2087	2570	46	102	2.23	-2.13	3.27	8.4	3.6
30	1500	520	4.85	2106	2586	45	98	2.14	-2.04	3.17	8.2	3.5
30	1500	540	4.74	2124	2600	45	94	2.06	-1.97	3.08	8.0	3.5
30	1500	560	4.63	2140	2613	44	90	1.98	-1.89	2.99	7.8	3.4
30	1500	580	4.53	2158	2628	43	86	1.91	-1.83	2.91	7.7	3.4
30	1500	600	4.43	2176	2643	43	82	1.84	-1.76	2.83	7.5	3.3
30	1600	400	5.34	2074	2619	50	136	2.82	-2.68	3.83	10.0	4.1
30	1600	420	5.26	2094	2635	50	132	2.73	-2.60	3.76	9.9	4.2
30	1600	440	5.19	2112	2650	50	127	2.65	-2.53	3.69	9.8	4.2
30	1600	460	5.09	2133	2666	49	123	2.57	-2.44	3.61	9.6	4.3
30	1600	480	5.05	2158	2686	48	117	2.46	-2.34	3.49	9.4	4.2
30	1600	500	5.01	2182	2706	48	111	2.35	-2.24	3.33	9.1	4.1
30	1600	520	5.29	2203	2723	47	107	2.25	-2.15	3.28	8.9	4.0
30	1600	540	5.17	2223	2739	46	103	2.17	-2.07	3.13	8.7	4.0
30	1600	560	5.05	2241	2754	46	99	2.09	-2.00	3.10	8.5	3.9
30	1600	580	4.95	2261	2770	45	94	2.02	-1.93	3.02	8.4	3.9
30	1600	600	4.86	2281	2787	45	90	1.95	-1.86	2.94	8.2	3.8
30	1700	400	6.37	2156	2745	52	147	2.93	-2.76	3.92	10.8	4.5
30	1700	420	6.30	2177	2762	52	142	2.85	-2.71	3.85	10.6	4.7
30	1700	440	6.23	2196	2777	51	138	2.73	-2.64	3.79	10.5	4.8
30	1700	460	6.14	2218	2794	51	133	2.69	-2.55	3.71	10.4	4.8
30	1700	480	5.99	2247	2817	50	127	2.57	-2.44	3.59	10.1	4.7
30	1700	500	5.85	2272	2837	49	121	2.46	-2.34	3.49	9.9	4.6
30	1700	520	5.73	2295	2856	49	116	2.37	-2.26	3.33	9.7	4.6
30	1700	540	5.60	2317	2874	48	112	2.28	-2.17	3.30	9.5	4.5
30	1700	560	5.49	2337	2890	47	108	2.20	-2.10	3.21	9.3	4.5
30	1700	580	5.38	2359	2908	47	103	2.12	-2.02	3.13	9.1	4.4
30	1700	600	5.29	2381	2925	46	99	2.05	-1.96	3.05	8.9	4.3
30	1800	400	6.80	2233	2868	54	157	3.04	-2.89	4.01	11.5	5.0
30	1800	420	6.73	2255	2886	53	153	2.96	-2.81	3.94	11.4	5.2
30	1800	440	6.68	2275	2901	53	148	2.89	-2.74	3.89	11.3	5.3
30	1800	460	6.58	2298	2919	53	143	2.81	-2.66	3.81	11.1	5.4
30	1800	480	6.43	2329	2943	52	137	2.69	-2.55	3.69	10.9	5.3
30	1800	500	6.30	2356	2965	51	131	2.58	-2.45	3.59	10.6	5.2
30	1800	520	6.17	2381	2985	50	126	2.48	-2.36	3.49	10.4	5.1
30	1800	540	6.04	2405	3004	50	121	2.39	-2.28	3.40	10.2	5.1
30	1800	560	5.93	2427	3022	49	117	2.31	-2.20	3.31	10.0	5.0
30	1800	580	5.82	2451	3041	49	112	2.23	-2.12	3.23	9.8	4.9
30	1800	600	5.72	2474	3060	48	107	2.16	-2.06	3.16	9.7	4.9
30	1900	400	7.23	2307	2989	55	168	3.15	-2.99	4.09	12.2	5.6
30	1900	420	7.17	2329	3006	55	163	3.08	-2.91	4.03	12.1	5.7
30	1900	440	7.12	2349	3021	55	159	3.01	-2.85	3.98	12.0	5.9
30	1900	460	7.03	2373	3040	55	154	2.93	-2.77	3.91	11.9	5.9
30	1900	480	6.88	2406	3066	54	147	2.80	-2.66	3.79	11.6	5.8
30	1900	500	6.74	2435	3089	53	141	2.69	-2.56	3.69	11.4	5.8
30	1900	520	6.61	2463	3110	52	136	2.59	-2.46	3.59	11.2	5.7
30	1900	540	6.49	2488	3131	52	131	2.50	-2.38	3.50	11.0	5.6
30	1900	560	6.37	2512	3150	51	126	2.42	-2.30	3.42	10.8	5.6
30	1900	580	6.25	2538	3170	50	121	2.34	-2.22	3.33	10.6	5.5
30	1900	600	6.16	2563	3190	50	116	2.26	-2.16	3.26	10.4	5.5
30	2000	400	7.66	2376	3106	57	179	3.26	-3.09	4.17	12.9	6.1
30	2000	420	7.60	2399	3124	57	174	3.19	-3.02	4.11	12.8	6.3
30	2000	440	7.56	2419	3139	57	170	3.12	-2.95	4.07	12.8	6.4
30	2000	460	7.47	2445	3159	56	164	3.04	-2.87	4.00	12.6	6.5
30	2000	480	7.33	2479	3185	55	158	2.92	-2.76	3.89	12.4	6.4
30	2000	500	7.19	2510	3209	55	152	2.81	-2.66	3.79	12.1	6.4
30	2000	520	7.06	2539	3232	54	146	2.71	-2.57	3.69	11.9	6.3
30	2000	540	6.93	2566	3254	53	141	2.61	-2.48	3.60	11.7	6.2
30	2000	560	6.80	2593	3275	53	136	2.52	-2.40	3.51	11.5	6.2
30	2000	580	6.70	2620	3296	52	131	2.44	-2.32	3.43	11.3	6.1
30	2000	600	6.50	2646	3317	52	126	2.37	-2.25	3.36	11.1	6.1

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## Ballistic Table — MK82 High Drag (Snakeye 1) Bomb (RPK10 — Valid All Airspeeds) (PM-3 — Valid Above 475 KEAS)

DIVE ANGLE	ALT ABOVE TGT	TAS	TIME OF FALL FROM REL	RANGE FROM REL	SLANT RANGE FROM REL	IMPACT ANGLE	AIM-OFF ANGLE	WIND CORRECTION FACTORS				
								HEAD	TAIL	CROSS	CROSS	TRACK OFFSET
deg	ft	kn	sec	ft	ft	deg	mil	mil/kn		ft/kn		ft/kn
30	2100	400	8.08	2442	3221	58	189	3.37	-3.18	4.24	13.7	6.6
30	2100	420	8.03	2466	3239	58	184	3.29	-3.12	4.13	13.6	6.8
30	2100	440	7.99	2486	3254	58	180	3.23	-3.06	4.15	13.5	7.0
30	2100	460	7.92	2512	3274	58	175	3.15	-2.98	4.09	13.4	7.1
30	2100	480	7.77	2547	3301	57	168	3.03	-2.87	3.98	13.1	7.0
30	2100	500	7.63	2580	3327	56	162	2.92	-2.76	3.88	12.9	6.9
30	2100	520	7.50	2611	3351	56	156	2.81	-2.67	3.74	12.7	6.9
30	2100	540	7.37	2640	3373	55	151	2.72	-2.58	3.69	12.5	6.8
30	2100	560	7.25	2668	3396	54	145	2.63	-2.50	3.61	12.2	6.7
30	2100	580	7.14	2697	3419	54	140	2.55	-2.42	3.53	12.1	6.7
30	2100	600	7.04	2724	3440	53	135	2.47	-2.35	3.46	11.9	6.6
30	2200	400	8.50	2505	3334	60	200	3.47	-3.28	4.31	14.4	7.1
30	2200	420	8.46	2523	3351	60	195	3.40	-3.21	4.27	14.3	7.3
30	2200	440	8.43	2542	3367	60	191	3.34	-3.15	4.23	14.2	7.6
30	2200	460	8.36	2574	3386	59	186	3.26	-3.08	4.17	14.1	7.7
30	2200	480	8.22	2611	3415	59	179	3.14	-2.97	4.07	13.9	7.6
30	2200	500	8.08	2646	3441	58	172	3.03	-2.86	3.97	13.7	7.5
30	2200	520	7.94	2679	3467	57	166	2.92	-2.77	3.87	13.4	7.5
30	2200	540	7.82	2710	3490	57	161	2.83	-2.68	3.78	13.2	7.4
30	2200	560	7.69	2740	3514	56	155	2.73	-2.59	3.70	13.0	7.3
30	2200	580	7.58	2769	3537	56	150	2.65	-2.52	3.62	12.8	7.3
30	2200	600	7.48	2793	3559	55	145	2.58	-2.45	3.55	12.6	7.3
30	2300	400	8.92	2564	3445	61	210	3.57	-3.37	4.38	15.1	7.7
30	2300	420	8.89	2583	3462	61	205	3.50	-3.31	4.34	15.0	7.9
30	2300	440	8.86	2610	3479	61	201	3.44	-3.25	4.30	15.0	8.1
30	2300	460	8.80	2633	3496	61	197	3.37	-3.18	4.26	14.9	8.3
30	2300	480	8.66	2672	3526	60	189	3.25	-3.07	4.15	14.6	8.2
30	2300	500	8.52	2703	3553	60	183	3.13	-2.96	4.05	14.4	8.1
30	2300	520	8.39	2743	3580	59	176	3.03	-2.86	3.96	14.2	8.1
30	2300	540	8.25	2776	3605	58	170	2.93	-2.77	3.87	13.9	8.0
30	2300	560	8.13	2807	3629	58	165	2.84	-2.69	3.79	13.7	8.0
30	2300	580	8.02	2837	3652	57	160	2.75	-2.61	3.71	13.6	7.9
30	2300	600	7.92	2868	3676	57	154	2.68	-2.54	3.64	13.4	7.9
30	2400	400	9.34	2621	3554	62	220	3.66	-3.46	4.44	15.8	8.2
30	2400	420	9.31	2644	3571	62	216	3.60	-3.40	4.41	15.7	8.5
30	2400	440	9.29	2667	3588	63	212	3.54	-3.34	4.37	15.7	8.7
30	2400	460	9.25	2689	3604	63	207	3.47	-3.28	4.33	15.6	8.9
30	2400	480	9.10	2730	3635	62	200	3.35	-3.16	4.23	15.4	8.8
30	2400	500	8.96	2763	3663	61	193	3.24	-3.06	4.13	15.1	8.8
30	2400	520	8.83	2803	3690	61	187	3.13	-2.96	4.04	14.9	8.7
30	2400	540	8.69	2838	3717	60	180	3.03	-2.87	3.95	14.7	8.6
30	2400	560	8.57	2870	3741	59	175	2.94	-2.78	3.87	14.5	8.6
30	2400	580	8.46	2902	3766	59	169	2.85	-2.70	3.80	14.3	8.5
30	2400	600	8.36	2934	3790	58	164	2.73	-2.63	3.73	14.1	8.5
30	2500	400	9.75	2674	3661	64	231	3.75	-3.55	4.50	16.5	8.8
30	2500	420	9.73	2693	3678	64	226	3.69	-3.49	4.47	16.4	9.0
30	2500	440	9.71	2720	3694	64	222	3.64	-3.43	4.44	16.4	9.3
30	2500	460	9.68	2742	3710	64	218	3.53	-3.37	4.41	16.4	9.5
30	2500	480	9.54	2784	3742	63	210	3.45	-3.26	4.31	16.1	9.4
30	2500	500	9.40	2823	3771	63	203	3.34	-3.15	4.21	15.9	9.4
30	2500	520	9.27	2860	3799	62	197	3.23	-3.05	4.12	15.7	9.3
30	2500	540	9.13	2897	3826	61	191	3.13	-2.96	4.03	15.4	9.2
30	2500	560	9.01	2930	3851	61	185	3.04	-2.87	3.95	15.2	9.2
30	2500	580	8.90	2963	3876	60	179	2.95	-2.79	3.88	15.0	9.1
30	2500	600	8.80	2996	3902	60	174	2.87	-2.72	3.81	14.9	9.1
30	2600	400	10.17	2726	3767	65	241	3.84	-3.63	4.56	17.2	9.3
30	2600	420	10.15	2743	3784	65	236	3.79	-3.57	4.53	17.2	9.6
30	2600	440	10.14	2771	3800	65	232	3.73	-3.52	4.51	17.1	9.9
30	2600	460	10.12	2792	3815	65	229	3.63	-3.47	4.48	17.1	10.1
30	2600	480	9.97	2835	3847	65	221	3.55	-3.35	4.38	16.9	10.0
30	2600	500	9.84	2876	3877	64	214	3.44	-3.24	4.29	16.6	10.0
30	2600	520	9.70	2916	3907	63	207	3.33	-3.14	4.19	16.4	9.9
30	2600	540	9.57	2952	3934	63	201	3.23	-3.05	4.11	16.2	9.9
30	2600	560	9.45	2986	3959	62	195	3.13	-2.96	4.03	16.0	9.8
30	2600	580	9.33	3020	3985	62	189	3.05	-2.88	3.96	15.8	9.8
30	2600	600	9.23	3054	4011	61	184	2.97	-2.81	3.89	15.6	9.7

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